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LIFESTYLE AND MEDICINE IN THE ENLIGHTENMENT

THE SIX NON-NATURALS IN THE LONG EIGHTEENTH CENTURY

Edited by

James Kennaway and Rina Knoeff

ROUTLEDGE

Lifestyle and Medicine in the Enlightenment

The biggest challenges in public health today are often related to attitudes, diet and exercise. In many ways, this marks a return to the state of medicine in the eighteenth century, when ideals of healthy living were a much more central part of the European consciousness than they have become since the advent of modern clinical medicine. Enlightenment advice on healthy lifestyle was often still discussed in terms of the six non-naturals – airs and places, food and drink, exercise, excretion and retention, and sleep and emotions. This volume examines what it meant to live healthily in the Enlightenment in the context of those non-naturals, showing both the profound continuities from Antiquity and the impact of newer conceptions of the body.

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Lifestyle and Medicine in the Enlightenment

The Six Non-Naturals in the Long Eighteenth Century

Edited by James Kennaway and Rina Knoeff

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Frontispiece “Physical Advice” by J. Harris, 1784. Courtesy of the Lewis Walpole Library



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1 "The most valuable part of medicine"

The six non-naturals in the long eighteenth century

James Kennaway and Rina Knoeff

Introduction

As part of his course on the "Institutes of Medicine," the famous Dutch medical teacher Herman Boerhaave (1668–1738) included lectures on the "Diet of Longevity," which he was in the habit of enlivening with patient case histories. On one occasion students recall Boerhaave reporting that,

> There now lives a Man in this City of *Leyden*, who has seen the Beginning and End of the seventeenth or last Century, being always very healthy; if he is asked by what means he has attained to so great an Age, he usually answers, by a Method you will not imitate, Temperance and Sobriety.
>
> (Boerhaave, 1757, pp. 6.267–277)

This comment about the Leiden centenarian is one of many positive eighteenth-century representations of the elderly. In contrast to previous eras, eighteenth-century old folk were no longer just satirically depicted as dying grandfathers heading to their graves, often surrounded by descendants quarrelling about the inheritance (Figure 1.1).

Physicians, particularly in Continental Europe, challenged the seventeenth-century idea that the weakening of old age (i.e. *marasmus senilis*) was an illness, and they argued that most old people do not die from old age but from a particular disease (Thane, 2003, 2005; Schäfer, 2015). As a result, stories, drawings and paintings often emphasised the possibility of continuing soundness of body as well as mind (Figure 1.2).

Moreover, eighteenth-century statistics suggest that in places such as the Netherlands, leaving aside child mortality, most people died past the age of 50 (see Figure 1.3). When asked, the very old themselves generally pointed to a balanced lifestyle (early to bed, moderation in eating and drinking and hard work) as the secret of healthy ageing. With his case report, Boerhaave likewise linked longevity to temperance and sobriety – characteristics that he apparently did not necessarily associate with his students.

Advice on how to live a long life – the field of regimen or dietetics – was a very significant branch of medicine in the long eighteenth century, even if



Figure 1.1 Tenth phase in the life cycle with dying centenarian and his heirs fighting over the inheritance, Assuerus van Londerseel, after Nicolaes de Bruyn, 1598–1602. Courtesy of the Rijksmuseum Amsterdam.

the historiography for the period in general has, for understandable reasons, focused more on important changes in theoretical conceptions of the body and disease. Historians have written extensively about topics such as the mad-doctoring trade or the physiology of the nerves, but regimen has been comparatively neglected. However, in terms of the published works of the period, regimen looms very large indeed, whether in medical literature, such as in the



Figure 1.2 Engraving of centenarian Willem Opperdoes, born in Haarlem in 1674. Drawn after life by C.V. Noorde, 1774. Courtesy of the Rijksmuseum Amsterdam.

medical textbook by Boerhaave mentioned above, or in the genre of medical advice literature for the public at large. Books such as Scottish physician William Buchan's bestseller *Domestic Medicine*, first published in 1769, often included a good deal of discussion of dietetics, along with advice on treating ailments at home. Buchan was expressing a widely held view when he suggested that "Regimen … is the most valuable part of medicine" (1772, p. v).

In order to understand Enlightenment thinking on healthy living, *Lifestyle and Medicine in the Enlightenment* focuses on the so-called six non-naturals (*sex res non naturales*), the areas defined by Hippocratic writers as the basis of health management and disease. The terminology of so-called six non-naturals, derived indirectly from the medicine of Antiquity, remained at the heart of discussion of regimen in the long eighteenth century. These were the factors (airs and places; food and drink; exercise; excretion and retention; sleep; and emotions) that usually provided the framework for understanding how lifestyle affected

A°. 1779. No. 7

AMSTERDAMSCHE COURANT.

WORD UITGEGEVEN BY HENDRIK LINSEN.

SATURDAG DEN 16 JANUARY.

AMSTERDAM DEN 15 JANUARY.

IN den onzen, van den 2den deezer, zeiden wy, dat het getal der geſtorven, zo binnen deeze STAD, als derzelver JURISDICTIE, in den Jaare 1778, en (waar onder ook begrepen waren, de dood ter Waereld gekomene) een getal van 7791 Perſoonen uitmaakte. —— Thans vullen wy dit BERICHT nog aan, met de volgende byzonderheden:

Onder de OVERLEDENEN zyn geweest 6970 CHRISTENEN, welker Ouderdom opgegeven is.
20 —— van onbekende Ouderdom.
224 —— die dood ter Waereld gekomen zyn.

dus 7214 CHRISTENEN.
94 PORTUGEESCHE JODEN. } wier Ouderdom niet
483 HOOGDUITSCHE JODEN. } is opgegeven.

te zamen 7791 Perſoonen.

Volgens opgave, was den OUDERDOM der CHRISTENEN, aldus:

	Jan.	Febr.	Maart	April	May	Juny	July	Aug.	Sept.	Octob.	Nov.	Dec.	Perſ.
Onder 't JAAR.	211	156	167	157	154	126	150	140	131	168	120	107	1787
de 2	39	32	26	19	19	23	25	17	25	41	30	31	327
— 10	112	60	57	41	41	42	73	69	102	140	152	66	955
— 20	31	15	18	9	16	21	19	19	29	31	37	20	265
— 30	38	21	34	19	27	30	32	31	41	43	26	35	377
— 40	52	41	40	43	35	45	31	49	67	42	49	32	527
— 50	71	46	38	34	58	55	53	52	53	44	46	28	578
— 60	69	42	29	38	43	44	37	35	58	46	41	47	529
— 70	95	53	61	59	47	49	51	45	46	64	49	57	676
— 80	67	76	51	55	37	41	45	38	60	54	39	63	626
— 90	41	21	27	15	14	29	8	16	20	27	26	30	274
— 100	9	4	5	4	4	3	2	1	1	4	5	2	44
TRUITJE VAN HAVIK, Oud 100 Jaar.	1	—	—	—	—	—	—	—	—	—	—	—	1
JOSEPH BONNET, Oud 101 Jaar.		1	—	—	—	—	—	—	—	—	—	—	1
GRIETJE SNOK, Oud 102 en 1 half Jaar.		1	—	—	—	—	—	—	—	—	—	—	1
CORNELIS ZWEERTS, Oud 102 Jaar en 21 Dagen.		1	—	—	—	—	—	—	—	—	—	—	1
MARIA OLDENMARKT, Oud 100 Jaar.		1	—	—	—	—	—	—	—	—	—	—	1
Dood ter Wereld gekomene.	14	31	14	26	23	21	9	17	20	12	22	15	224
Onbekende.	8	2	1	1	1	1	1	2		2	1		20
	858	603	568	521	520	530	536	531	653	718	643	533	7214

Voegt hier by Portugeeſche Joden - — 94
Hoogduitſche Joden - — 483

Maakt te zamen 't getal van 7791

Figure 1.3 Death rates of the city of Amsterdam over the year 1778. Published in the *Amsterdamsche Courant*, 16 January 1779.

health. They are mentioned as such in Diderot and d'Alembert's *Encyclopédie* (1751–1772), even if the entry's author takes a slightly snooty line on the term as "inappropriate" (1751–1772, p. 11.217).[1] Drawing on Boerhaave, as well as the Scottish physician Archibald Pitcairne and the Montpellier doctor François Boissier de Sauvage, it describes them as those things "which do not compose our nature or our being, but of which the animal economy experiences great effects, great changes, great alterations" (Diderot and d'Alembert, 1751–1772, pp. 11.217–218).[2]

It is striking that the fundamental rules advocated by medical writers on regimen were essentially sound, with precepts around moderation and

exercise that would seem very familiar today. While therapeutics and physiology have changed out of all recognition, in some ways regimen offers an image of remarkable continuity not just since the eighteenth century but since Hippocrates. That also means that dietetic advice was presumably one of the most reliable aspects of eighteenth-century medicine, since its principles of temperance would often have been beneficial in their impact. However, if thinking on how to stay healthy and live a long life reflected a high level of continuity to traditional humoral medicine, newer ideas of mechanical medicine, nervous stimulation and conceptions of individual liberty also played a key role in Enlightenment views of the topic.

The long eighteenth century was in many ways the last age of the six non-naturals. As a comprehensive health programme, they disappeared from clinical medicine in the nineteenth century, as the specific terminology of the non-naturals came to seem scholastic and old-fashioned. More broadly, although medical advice on healthy living never went away, compared to the heroic advances associated with the shift to Parisian hospital medicine and local pathology and developments in disciplines such as bacteriology, dietetics became a real backwater. For much of the period since the mid-nineteenth century, hopes for improvements in longevity and healthy living were primarily fixed on scientific breakthroughs, but in the past few decades there has been what one might see as a pendulum swing back towards the dietetic focus of the eighteenth century. The major health challenges in the prosperous world, and more and more in other countries too, relate to lifestyle issues like obesity, exercise and smoking for which the clinical medicine focused on localised pathology that was so triumphant in the nineteenth and twentieth centuries has few answers. Likewise, in a neoliberal society that increasingly emphasises people's own responsibility for their own health, the ideas at the root of the six non-naturals are staging a remarkable comeback.

The six non-naturals

The definition and description of the non-naturals have been ascribed to Hippocrates, but they were first formulated by Galen in his commentary on the Hippocratic writings on epidemics and elaborated in his other works on medicine and health. Galen wrote in his *Ars medica* that,

> The causes of change in the body are divided into the 'necessary' and the 'not-necessary'. By 'necessary' I mean those which it is impossible for a body not to encounter; by 'not-necessary', all others. Constant contact with the ambient air is necessary, as are eating and drinking, waking and sleeping; contact with swords and wild beasts is not. The art concerned with the body is thus performed by means of the former, not of the latter. And if we make a classification of all the necessary factors which alter the body, to each of these will correspond a specific type of healthy cause.

> One category is contact with the ambient air; another is motion and rest of the body as a whole or of its individual parts. The third is sleep and waking; the fourth, substances taken, the fifth substances voided or retained; the sixth what happens to the soul.
>
> (Singer, 1997, p. 374)

Galen actually never used the term "non-naturals," but he named them categories of health. The correct application of these categories would lead to the preservation of health, and misuse render them morbid. Everything depended on finding the right balance for each individual constitution. That was the task, Galen pointedly said, for the physician who has a "proper understanding" of the nature of these categories for the formulation of individual regimen, i.e. rules for a healthy lifestyle which depend on a combination of variable factors such as sex, age, labour, social activities and climate.

Galen's ideas were developed into the format of the six non-naturals in medieval Arabic and Western medicine, and they remained the basis for medical thinking on dietetics well into the early modern period. Curiously, the formulation of new medical ideas based on mechanics and chemistry during the late seventeenth and eighteenth centuries did not lead to a diminishing importance of the non-naturals, as one would perhaps have been inclined to expect. On the contrary, the Hippocratic emphasis on investigating the endless variety of nature was combined with a renewed stress on observation as the physician's only guide made the non-naturals more important than ever. For instance, Herman Boerhaave's pupil Jerome Gaub (also known as Hieronymus Gaubius) (1705–1780), famous across Europe for his *Institutiones pathologiae medicinalis* (1758), stated that it was of paramount importance for the physician to employ mechanics, physics, chemistry and medicine in order to investigate the non-naturals and understand the effects they produce (1778, p. 134).

In order to illuminate the history of dietetics in the long eighteenth century, this book is divided into six parts, each with two chapters devoted to one of the six non-naturals.

1. *Airs, waters and places*
   The first non-natural is concerned with the effects of the environment on health and disease. It builds on the Hippocratic treatise *Airs, Waters, Places*, written around 400 BC, and is concerned with the quality of air, the health effects of the winds, the changing of the seasons, the quality of (drinking) water and the richness of the soil upon which people live. Interestingly, it is also about ways of life and social and cultural habits and includes descriptions of national stereotypes.
2. *Food and drink*
   During the Enlightenment, as worries about luxury lifestyles increased, healthy food and drink were a central concern in medical advice literature.

Discussions not only focused on moderation and the question of what constitutes a moderate way of life but also included a constantly shifting debate about healthy and unhealthy food related to the variable factors of sex, age, employment, intelligence and lifestyle.

3. *Exercise and rest*
   Ever since the origin of the Greek gymnasium, doctors have given advice on the right amount of exercise for the body. In Antiquity, this advice focused on moderation: not too much, not too little, or, in the words of Galen, exercising with a small ball rather than running the marathon (Singer, 1997, pp. 299–304). The eighteenth century saw a revival of classical thinking on exercise, sports and health. These ideas were highly moral and embedded in philosophies of mind–body relations as well as rooted in burgeoning ideas about masculinity and the strength of the nation-state.
4. *Sleep and wakefulness*
   Although it is a relatively neglected area of research in premodern medicine, sleep and wakefulness were considered important indicators for health and well-being. Based on the Aristotelian treatise *De somno et vigilia*, physicians speculated about healthy sleep, dreaming, sleep terrors, insomnia, nocturnal emissions and sleepwalking. During the eighteenth century, sleep was closely related to discussions on social behaviour and morality, especially in the context of what Elizabeth Hunter in her chapter calls "the husbandry of time."
5. *Excretion and retention (of faeces, urine, sweat, blood, semen, etc.)*
   Since the biological working of the body is involved, the labelling of excretion and retention as a non-natural can lead to confusion. However, being closely linked with food and drink, excretion and retention are often about removing substances that are superfluous or alien to the nature of the body. It follows that health was always a careful equilibrium between excreting bodily waste and retaining the vital fluids. Notably, Enlightenment medicine, with its emphasis on the chemistry of vital fluids and the conservation of body economies, saw a remarkable comeback of ancient humoralism.
6. *Passions and emotions*
   Mental states and passions, such as anger, lust, sadness, fear, surprise, scorn, disgust and despair, had been a central aspect of medical thinking on lifestyle from Antiquity, with a widespread assumption that they could influence health and both cause and cure disease, in a way we would now term psychosomatic. In the eighteenth century, the passions were increasingly understood in the context of the nerves, but older ideas focused on the relationship between digestion and emotional life continued to be influential. At the same time, emotional symptoms were understood sometimes to have their origins in the body and the passions themselves could be depicted as "diseases of the soul" in their own right.

An Enlightenment in regimen?

The eighteenth century may often appear as something of a Cinderella period in medical history compared to the extraordinary achievements of the seventeenth-century "Scientific Revolution" and the triumphs of the nineteenth century. How does this affect the subject of regimen? To what extent was there an Enlightenment in eighteenth-century dietetics? In many ways, what stands out most is the extent to which the period saw profound continuities to traditions stretching back to Antiquity, rather than any radical step towards rational, scientific modernity. Indeed, there was a revival of Hippocratic medicine, notably in the wake of Herman Boerhaave and the "English Hippocrates," Thomas Sydenham. Medical textbooks were structured along the lines of Hippocrates' *Aphorisms*, Hippocrates' method of (bedside) observation and trust in the healing powers of nature was eagerly followed, the Hippocratic dictum that man's health must be seen in relation to the totality of one's environment was discussed at length. In short, medical theory was often characterised by contemporaries with the slogan *Hippocrates redivivus* – Hippocrates lives again (Cantor, 2002). Traditional models of the centrality of digestion and of the power of the mind over the body to create and cure disease continued to be remarkably influential in regimen, despite the new interest in the nerves and sensibility and the impact of (supposedly) Cartesian thinking on the soul (Kennaway and Andrews, 2019). On the other hand, key aspects of the Enlightenment were reflected in medical advice on how to live a healthy life. Newer ideas derived from seventeenth-century mechanical philosophy in relation to anatomy, physiology and chemistry did have an impact. And while the language of the humours survived, it was often conceived of less in terms of imbalance and more of chemistry.

More broadly, the chief concerns of eighteenth-century dietetics certainly did reflect the broader social and intellectual world of the Enlightenment. The non-naturals experienced a revival in the eighteenth century as their focus on lifestyle fitted the Enlightenment belief in reason and the individual's power to determine his/her own life. The period's focus on healthy lifestyles was part of a discourse that valued the intrinsic value of individuals and formulated notions of national and personal identity. Autonomy and economic participation were highly valued, also in the elderly. As Dorinda Outram has argued, the idea of individual self-mastery of bodily health served to justify claims to political and liberal self-sovereignty (1989). A new bourgeois body was created, instituted by the sciences of health and hygiene and policed by the individual himself (Porter, 2003; Reeves, 2010). As a result, the eighteenth century saw the birth of popular lifestyle journals and advice literature written by doctors, often aimed at women, who were considered in charge of the household economy. Discussions of regimen for maintaining health remained overwhelmingly a matter for individuals rather than a question of "public health." The so-called "medicinische Policey" (medical policy) that developed in some German territories may have foreshadowed the future involvement of the state that has

been such a mark of medical modernity, but it was marginal compared to the torrent of publications related to private dietetics, and in many places the only physicians in government employ were in the military.

Health behaviour was closely related to issues of morality and played out in every area of life. The impact of the rise of the Enlightenment *homo economicus* made itself felt in discussions of dietetics, notably in advice on sleep, where physicians increasingly seem to stress class and the efficient husbanding of time. Adam Smith in his *Wealth of Nations* (1776) often invoked health regimen in arguments about the preservation of the workforce. Sermons emphasised health and longevity as a religious duty and vitalist ideas about the body's natural store of life forces inspired ideas on how humans must be as economical in their consumption of life as they should be in housekeeping. In short, health and hygiene were part of a rational discourse about moral responsibility aimed at the betterment of both body and society.

The mixing of ideas of morality and health already had a long history by the eighteenth century, most potently in terms of Christian notions of gluttony, idleness and sin. Echoes of religious concerns about excess can be heard in the *Encyclopédie*'s suggestion that dietetics was the business of maintaining "the state of health" in the face of "the vices which tend to destroy it, or which have already done so" (Diderot and d'Alembert, 1752–1772, p. 4.975). The image on the frontispiece of our book, "Physical Advice" (i.e. health advice), by an Irish merchant and artist working in London called John Nixon (1755–1818), strongly suggests an emphasis on issues related to lifestyle medicine and greed. The patient, sticking his tongue out to be examined by a doctor, who is taking his pulse, appears to be suffering from that famous eighteenth-century malady of the prosperous, gout. For that reason, he has his foot on a stool and is taking an interest in his diet, as is reflected in the cookbook on the table. The book is open at the page with a recipe for turtle soup, a notably rich and expensive dish.

While such anxieties about sickness and immorality were not new, the eighteenth century did see extensive discussions of medical fears that the specific character of modern urban life and its thrills, excesses and indulgences could overstimulate the body and the mind and cause serious illness. Although some have argued that the medicine and regimen of the "diseases of modern life" is essentially a nineteenth-century phenomenon, it is clear that in essence the whole discourse can be found in the previous century. Drawing on Classical and Biblical injunctions on the moral dangers of luxury, doctors in the period developed an explicit medical critique of the perils of many aspects of contemporary life, especially in the expanding metropolitan centres of London and Paris. The association of illness with wealth and status led to a substantial discussion of "fashionable diseases" (Shuttleton, 2017; Kennaway and Andrews, 2019). Many of these anxieties related to the massive increase in access to the stimulating products of European colonies beyond Europe, especially things like tea, the subject of the English philanthropist Jonas Hanway's *An Essay on Tea* (1757), for instance. Similar concerns were expressed about

other stimulants found in cities – modern novels, music and the theatre, all of which were often considered a potential source of overexcitement (Kennaway, 2010, 2016).

Outline of this volume

Historians have often mentioned the non-naturals, but with the partial exception of the work of Cavallo and Storey and Bergdolt, the subject has been strikingly overlooked by historians compared to other aspects of medicine. Remarkably, even today there are very few systematic studies of the history of regimen or the six non-naturals per se; a British Library search for the phrase "six non-naturals" (and its variants) comes up blank as far as secondary literature is concerned. Most of the research on the topic has either dealt with philological questions related to the origin of the non-naturals or has focused on in-depth discussions of only one or two of the non-naturals (Jarcho, 1970; Bylebyl, 1971; Niebyl, 1971; Bergdolt, 2008; Cavallo and Storey, 2013, 2017). For example, food history has been a rich field over the past 20 years and has contributed to our understanding of the role of eating and drinking in conceptions of healthy living (Guerrini, 2000; Spary, 2012, 2017). The role of emotions in health, the "Passions of the Soul," has also been the subject of a good deal of recent work (Corneanu, 2011; Lawlor, 2012; Cerrara, 2013). However, some of the other non-naturals have been comparatively ignored. Histories of sport and exercise have largely focused on Antiquity, but they have received virtually no attention in the context of the Enlightenment (von Mallinckroth and Schattner, 2016). This also goes for histories of sleep and histories of excretion which have started to attract attention, but have hardly been discussed in relation to the eighteenth century (Stolberg, 2015; Handley, 2016). The theme of airs and places has primarily been discussed in a British context and clearly requires a broader geographical interpretation (Golinsky, 2007; Wear, 2008). The authors of *Lifestyle and Medicine in the Enlightenment* take the crucial next step by analysing how the non-naturals related to one another, how the crucial aspect of "balance" was defined and understood and also how the non-naturals worked in practice: How did doctors sell their advice? How were the non-naturals accommodated into daily life? Was there a difference between men and women, different age groups and kinds of physical work in the application of health advice? These questions have the aim of teasing out how the non-naturals – and by extension healthy ageing initiatives – are intimately bound up with cultural, political, social and moral motivations.

In Chapter 2, "The body is a barometer: Dutch doctors on healthy weather and strong constitutions," Rina Knoeff kicks off the discussion of the individual non-naturals by looking at the role of airs and places. She examines the influence of the idea of the body as being akin to that emblematic Enlightenment piece of equipment, the barometer, in its susceptibility to climactic variation. British thinking on the links between nervous sensibility and the weather has been investigated before, but Knoeff shows that continental

observers, particularly in the Netherlands, approached the topic in terms of the physiology of the fluids and fibres (Golinsky, 2007). As such, the chapter thus contributes to the broader picture in this volume of the level of continuity in terms of the ancient doctrine of the humours, albeit reconfigured in new ways. Knoeff also shows how Dutch physicians wrote about health and climate in a self-consciously national context, often arguing that their climate was remarkably suited for long life.

The theme of airs and places continues in Chapter 3, "Hot climate and health care: tropical regions in the Dutch Atlantic, c. 1600–c. 1800," by Stephen Snelders. As the title suggests, it examines the Dutch experience beyond their own shores and how their physicians understood the challenge of regimen in hostile colonial climates. In particular, it looks at *Kunst-broederlyke lessen of noodige aanmerkingen, wegens de Koortszen op Schepen van Oorlog* ("Teachings of a Brother of the Art (…) Concerning Fevers on Warships") (1742), and the *Geneeskonst der heelmeesters in dienst der zeevaart* ("Ships' Surgeons Medicine") (1752) by the Amsterdam surgeon Abraham Titsingh. These books offer an illuminating example of how Western physicians, with ideas often inherited from Antiquity, responded to the often very different conditions and illnesses of the tropics, in a way parallel to Mark Harrison's work on the emergence of empirical methods in British imperial context (2010). The chapter also considers the vital Enlightenment concept of race in the dietetics suitable in the multi-ethnic Dutch colonies.

Chapter 4, "Eating after the climacteric: food, gender and ageing in the long eighteenth century" by Elizabeth Williams, turns to the role of food and drink in eighteenth-century French dietetics. In particular, it considers the position of food in regimen for older women, a doubly marginalised group both in eighteenth-century medicine and subsequent historiography. She sets out the way that medical thinking about eating and drinking was linked to different periods in female reproductive life and menstruation, focusing especially on the climacteric, that is what by the 1820s came to be called the menopause. There was a significant debate on what was a suitable diet for women at that "critical time." Williams ends by showing how the sense of a strong gendered element to regimen and the ageing process was fading by the 1840s under the influence of Paris medicine.

Continuing the theme of eating and drinking, Anita Guerrini looks at the question of temperance and longevity in Chapter 5, "The impossible ideal of moderation: food, drink, and longevity." It considers the relationship between moral and medical conceptions of temperance in a complex Early Modern religious context, from Catholics such as the Renaissance Venetian Luigi Cornaro and the Flemish Jesuit Leonard Lessius to Protestants of various stripes, such as Thomas Tyron in the late seventeenth century and the famous Scottish Enlightenment physician (and recovered glutton) George Cheyne. While the central idea that moderation in all things was vital for health that went back to Antiquity remained in place, as Guerrini shows, the physiological framework assumed to be involved changed under the influence of new ideas from figures

such as Paracelsus and Isaac Newton. Guerrini also considers another important shift, related to the impact of luxury colonial imports as the "curse of empire." It concludes by looking at what the material culture of the period can tell us about the question, by providing clues to what contemporaries meant by a "bottle" of wine or a "cup" of coffee.

Eighteenth-century dietetic thinking on exercise is first considered in Chapter 6, "For it is the debilitating fibres that exercise restores": movement, morality and moderation in eighteenth-century medical advice literature" by James Kennaway and Rina Knoeff. It considers the impact of new thinking on the role of the "fibres" in Enlightenment physiology on medical views of what constituted healthy activity. Previous early modern regimens had tended to focus on maintaining a balance in the body's humours through moderate exercise, but over the eighteenth century one sees a shift towards the idea that vigorous activity would be the best way to restore the fibres. This change was also affected by a broader cultural context in which a social critique of the idle rich and their diseases meant that "passive" exercise such as travelling by coach or sedan chair came to be seen in a less positive light by physicians. However, light exercise continued to be praised in the context of valetudinarians, those too weak for serious exertion. For them, even things such as being rubbed by a "flesh brush" were prescribed as a suitable form of exercise.

In Chapter 7, "The healthy body, civic virtue, gender, and the new physical education in Germany 1770–1800," Teresa Sanislo continues the examination of the exercise and rest as non-natural. She looks at the ways that the theme of "mens sana in corpore sano" was understood in medical, moral and national terms in a key period. In particular, she examines the so-called Philanthropinist movement, a group of German intellectuals such as Christian Salzmann, Johann Bernhard Basedow and Joachim Heinrich Campe who drew on the work of John Locke and Jean-Jacques Rousseau to advance an Enlightenment conception of educational theory. The movement was especially interested in the medical, moral and patriotic importance of exercise. Like the chapters by Kennaway, Schmidt and Hunter, Sanislo shows the role of medical fears about modern urban life, arguing that concerns about the "feminisation" of modern Germans were behind the focus on patriotic physical fitness.

Chapter 8, "'That venerable and princely custom of long-lying abed': sleep and civility in seventeenth- and eighteenth-century urban society," by Elizabeth Hunter is the first chapter on sleep. In it, she considers sleep in terms of the relationship between English medical ideas about healthy lifestyle and the social context in which idleness and the husbanding of time had powerful connotations in terms of class, gender and morality. She starts with Dekker's *The Gull's Hornbook* (1609), which took on the nocturnal habits of the "gallants" of London, before turning to the role of sleep and health in John Locke's *Some Thoughts Concerning Education* (1693). Like Schmidt in the following chapter, she draws attention to the impact of bourgeois conceptions of time and productivity on the dietetics of sleep. Her final principal source is George Cheyne, a familiar figure from many other chapters in this volume. After years

of excess and late nights, Cheyne adopted a new healthy regimen and wrote about its success. The fashionability of an ostentatiously unhealthy late-night, late-rising rakish lifestyle contrasted with more puritanical bourgeois instincts and mainstream health advice, which continued to take a tough line on the poor sleep regime. Hunter shows how the "nocturnalisation" of life in cities like London created a medical/moral reaction.

Another chapter on sleep is Chapter 9, "Wasted days and wasted nights: sleeping and waking in the long eighteenth century" by Roger Schmidt. Here, Schmidt examines the relationship between medical views of sleep and the idea of the efficient husbanding of time as a key facet of developing modernity, with resonance with the Fitbits of the twenty-first century. He also shows how ideas about sleep increasingly reflected the sense that there was a moral and medical duty to be productive and avoid oversleep. Drawing on literary figures such as Jonathan Swift and Samuel Johnson as well as physicians such as John Floyer and George Cheyne, Schmidt shows the extent to which exact Newtonian conceptions of time affected eighteenth-century British thinking on the dietetics of sleep. In parallel to Rina Knoeff's comments in Chapter 2 on the role of the material mechanical model of the barometer, he points to the impact of the model of clocks and clockwork mechanisms in Enlightenment thinking on regimen and of time.

Moving on to the theme of excretion and retention, Michael Stolberg in Chapter 10, "Keeping the body open. Impurity, excretions, and healthy living in the early modern period," looks at the 70-page manuscript diary of regimen kept in the 1650s by the French historian, soldier and diplomat François-Nicolas Baudot, sieur Dubuisson-Aubenay. In this private journal, a valuable source for the patient's view of the subject, he recorded his excretions in great detail, illuminating contemporary views on dietetics and the physiological processes behind them. He emphasises that the eighteenth-century conception of the humoral system was important in different ways from the Classical model of balance, focusing more on the ideas of impurity and stagnation (Knoeff, 2002). Excretion remained key in this newer view, removing "peccant humours" from the body that otherwise would cause illness. Stolberg shows how the ageing body was understood to accumulate excess impure "excremental matter," weakening the innate heat on which physiological processes depended. He also discusses the way that excretion and retention, with their connection to emetics, purgatives and so forth, overlapped more with therapeutics than many other non-naturals.

In Chapter 11, "Increasing and reducing: breastmilk flows and female health," Ruben E. Verwaal examines regimen of the excretion and retention in terms of the issue of mother's milk, especially with regard to the Netherlands. He looks at views of the issues of excessive and inadequate milk production and the attitudes towards women involved. Verwaal shows the extent to which by the eighteenth century the physiology behind the dietetic advice on breastfeeding was essentially chemical as much as a matter of traditional humoral balance. Like Stolberg, he provides the patient's as well as the physician's view of

retention and secretion, drawing on correspondence. Like several other chapters, he also considers the role of material culture in this context, writing about the development of breast pumps. Likewise, his discussion of the role of gender and morality in the discourse on the regimen of breastfeeding resonates with the broader themes raised in this volume.

In Chapter 12, "Feel-good tunes: music aesthetics, performance and well-being in the eighteenth century," Wiebke Thormählen looks at the role of dietetic ideas of music and the emotions in the British context. Looking at Charles Avison's *Essay on Musical Expression* (1752), Richard Browne's *Medicina Musica* (1723), Johan Georg Sulzer's *Allgemeine Theorie der schönen Künste* (1771) and John Burton's *A Treatise on the Non-Naturals* (1738), Thormählen considers how music's specifically emotional impact and its role in regimen were reflected in aesthetic and moral thinking on the subject. While previous observers had often turned to ideas of universal cosmic harmony to explain music's importance, Enlightenment writers on the subject generally assumed that it affected human emotions via the body. This argument opened up all sorts of problems in relation to music's aesthetic and moral status, as Thormählen sets out. Like Kennaway in Chapter 13, she shows how the medicine of the period was happy to use both an older language of digestion and one of nerves and stimulation to explain music's impact.

Another chapter on the role of emotions in eighteenth-century ideas of regimen is Chapter 13, "The dietetics of the soul in Britain in the long eighteenth century," by James Kennaway. Doctors since ancient times had generally assumed that the emotions, "the passions of the soul," such as sadness, lust, love, despair and fear, could have a potent effect on the health of the mind and body. As Kennaway shows, eighteenth-century physicians and lay observers continued in these assumptions, with little evidence of any strict division between the two that some have believed to have been ushered in by the work of Descartes. He also stresses the continuity in the centrality of the digestive system in the physiological basis for the link between body and mind and argues that the historiography has hitherto often seriously exaggerated the shift from the guts to the nerves. In line with many others in this volume, this chapter stresses the role of morality in discussions of regimen. Stoic, Christian and bourgeois notions of emotional restraint can often be seen in medical guise. External stimuli, especially those perceived as modern, that threatened to provoke excessive feeling, whether in the form of music, books, love or "enthusiastic" religion, were thus widely regarded as dubious by medical writers.

Finally, Tessa Storey wraps the book up in Chapter 14, "'That is more excellent which preserveth health and preventeth sicknesse': continuity and change in preventive vernacular preventive health advice over the early modern period." Storey provides a valuable perspective on the major themes raised in the book and on some of the main points of continuity and change in dietetics from the Renaissance to the Enlightenment, drawing on her work on Early Modern regimen. Her contribution looks at the overarching principle of moderation and takes a long view of the relationship between regimen and

class, especially for the elite, for whom most work on the topic was focused throughout the period. Similarly, it looks at the role of gender, and how dietetics reflected the assumption of the centrality of reproduction for women and military prowess for men in different ways over the centuries. It then goes on to consider matters of dissemination and reception, that is, the issue of who exactly was reading dietetic advice, before looking at the role of changing contexts in material culture and in scientific culture and methods in reframing assumptions on how to live a long life.

Taken together, these chapters thus offer a view of dietetics in the long eighteenth century that shows that it was not a peripheral subject. It was a subject that filled innumerable books, often published in great quantities, in a world of expanding literacy. Its centrality is also reflected in the regularity with which physicians' correspondence with patients dealt with advice on how to stay healthy. Nor was it intellectually moribund. While it may have lacked the fireworks of the previous and subsequent eras and remained very much steeped in Hippocratic and Galenic thinking, it did produce a discourse on how to achieve a healthy long life that also reflected more innovative parts of medicine, notably in terms of nervous sensibility and a recasting of the humours in terms of chemistry. The dietetics of the period also reflected the Enlightenment context, focusing on the medical and moral perils of modern life and relishing the power of the individual to shape his or her own well-being in a way that has striking relevance for our own day.

Notes

1 "impropre."
2 "compostent pas notre nature ou notre etre, mais dont l'economie aninamle eprouve de grands effets, de grands changements, de grand alterations."

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Part 1

Airs, waters and places



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2 The body is a barometer

Dutch doctors on healthy weather and strong constitutions

Rina Knoeff

In 1765, the Royal Dutch Academy of Sciences published *Discourse on the Use of the Barometer in Medicine*, written by Jean Berryat (1718–?), a French medical doctor and correspondent of the Paris Académie Royale des Sciences. Although Berryat himself was hardly known at the time and is generally forgotten by historians, his discourse on the barometer was regularly quoted by eighteenth-century Dutch physicians in their argument that the human body is so much affected by atmospheric fluctuations that it literally acts as a barometer. In particular, two patient reports, both from 1746, attracted a lot of attention and were repeated numerous times:

1. A certain captain of the *de Vieille Marine* regiment could always correctly predict a day beforehand, even when the skies were crystal clear, when to expect rain through "heavy cramps in his bowels, a weakening of the stomach, many evacuations and an unaccountable melancholy".
2. The dropsical wife of Mr. Bordeaux, clerk of the Provost of Auxerre, complained of severe obstipation when heavy rain was in the air. The upcoming rain was even noticeable in a measurable increase in the contours of her heavy stomach. She subsequently suffered from a shortness of breath, cramps in her calves and other attacks. Berryat observed that all these symptoms dovetailed with changes on his barometer to such an extent that he could successfully warn Mr. Bordeaux of expected changes in his wife's constitution without even seeing her.

(Berryat, 1765, pp. 156–158)

Berryat explained the remarkable similarities between changes in the weather and bodily symptoms with reference to air pressure. He argued that the air surrounding and pressing upon the human body from the outside is counterbalanced by 'the air, which permeates our blood and other humours, and which is of the same nature as the surrounding air'. It follows that if air pressure is always and everywhere the same, it would not affect the air trapped inside the body; body and environment would be completely balanced and man would never experience the effects of changing air pressure. Yet, since the atmosphere is changeable, each individual body continuously changes with it and

experiences the elasticity and gravity of air. In particular, the physiological process of breathing is affected by changes in air pressure – for it directly leads to fluctuating pressure upon the alveoli and the blood vessels in the lungs. Together with changes in the blood circulation, these often result in bodily complaints, most often of the chest and head. Hence, Berryat argued, the head 'because of its giddiness, headaches and light headedness, is for many people a barometer' (1765, pp. 153–154). Consequently, if the body is susceptible to atmospheric changes, a barometer can predict bodily ailments and is of invaluable help in the prevention of disease. In the cases mentioned above, this meant that as soon as the barometer dropped and predicted rain and wind, Berryat prescribed to the captain of the *Vieille Marine* a milk-based diet and other stomach strengthening medication. But he advised the opposite to the wife of Mr Bordeaux: purges and other laxatives so that the surplus bodily fluid would flow to her intestines instead of the outer parts of her body. In so doing, Berryat cured both his patients with the help of a barometer (1765, pp. 149–165).

An important reason why Berryat's little treatise became central to Dutch medical arguments about physiology in relation to atmospheric changes was its outspoken optimism about the controllability of climate in relation to the body. At the time, the Dutch paradoxically emphasised the beneficial effects of what was formerly seen as extremely bad and harmful weather. Before the Enlightenment, the weather was considered uncontrollable and threatening, an outside factor that could make or break the body. In particular, in the Netherlands, heavy (thunder) storms and periods of severe cold had led to dike breaches, flooding and many casualties. In religious treatises, extreme weather was often linked to God's providential will, to which man had to submit himself. During the eighteenth century, however, as a result of new mechanical and chemical physiologies and a general optimism about the manipulability of body and society, physicians put forward the argument that the effects of weather were controllable. And the barometer was pushed forward as an instrument that forecasted both the weather and the health of the Dutch nation and its people. Moreover, as Dr Berryat's little treatise showed, a sound prediction of weather changes led to an adequate prevention of disease. In other words, the negative effects of atmospheric changes could be mastered, and medical doctors held the key.

Yet, these same physicians are generally merely glossed over by historians discussing the relation between weather and health. In the tradition of Anglo-Saxon historiography, most historical work focuses on the metaphorical, social and cultural meanings and constructions of the relation between body and weather primarily in an English context (Schaffer, 1990; Castle, 1995; Golinski, 2007; Wear, 2008). Jan Golinski has recently argued for British experiences with the weather that the barometer conveyed values associated with the Enlightenment. Together with the thermometer, it became the most widely circulated luxury accessory of polite science: 'to many who bought it, the apparatus was a conversation piece, an obscure reflection of bodily sensibilities, and an oracle that might foretell the future' (Golinski, 2007, p. 121;

see Golinski, 1999). Terry Castle has similarly argued that eighteenth-century weatherglasses came to represent the Enlightenment image of women. In particular, the mercury inside weather instruments embodied the fickle (and untrustworthy) character and nervous sensitivity of women (Castle, 1995). A well-known and often quoted example is William Hogarth's satirical *Credulity, Superstition and Fanaticism* (1762), which represents a barometric scale of passions springing from the brain. It sums up the argument that Enlightenment reason and virtue were continuously threatened by a turmoil of emotions.

The accounts of both Golinski and Castle are part of a dominant emphasis on sensitivity and nervous diseases in the age of the Enlightenment (see Vila, 1998; Riskin, 2002; Rousseau, 2004). The Dutch case, however, exemplifies that susceptibility to the weather must be understood in the context of an eighteenth-century physiological obsession with fluids and fibres rather than the nervous system. Thus, instead of seeing the weather in relation to cultures of sensibility and corresponding emotional states (see Golinski's argument), the Dutch considered the weather in relation to the strength (or weakness) of fibres underlying the physiology of the body economy.[1] It logically follows that according to Dutch doctors, the body, rather than the mind, was primarily affected by atmospheric changes. Eventually, this led to a much more optimistic attitude towards the effects of 'bad weather'. Contrary to accounts about climatic sensitivity which tended to focus on declining health and emotional weakness, Dutch descriptions about the effects of cold, rain and wind functioned in arguments about the contraction and strengthening of bodily fibres and the vigour of the constitution of Dutch people.

It is in this context that we must consider the eighteenth-century Dutch revival of the Hippocratic treatise *Airs, Waters, Places*, written in the year 400 BC. This treatise argues for a causal connection between a region's characteristics (in particular, climate, seasonal differences, the quality of water and soil of a place) and its inhabitants' health. Physicians have speculated about the close ties between climate and health ever since. As the editors of a recent journal issue on *Modern Airs, Waters, and Places* have stated: 'This tradition (of *Airs, Waters, Places*) has proved remarkably resilient and adaptable, redeployed in diverse historical contexts across time' (Bashford and Tracy, 2012, p. 497; see Fleming and Jankovic, 2011). Among Dutch physicians, the barometer (often accompanied by a thermometer) was central to the Hippocratic revival. Not only was medical practice guided by weather predictions foretelling what precautions to take in order to avoid (epidemic) illness, also the body itself was considered an instrument that could feel, predict and visually represent climatic circumstances and changes. Even more, the barometer gradually became the instrument *per excellence* to unite doctors and gentlemen in large networks investigating the question of how man's natural habitus is related to his health.

In order to understand how the barometer contributed to the remarkably optimistic Dutch attitude towards the weather, I first discuss 'the nature' of Dutch weather during the eighteenth century, which was characterised by periods of extreme cold and hot summers. I argue that dealing with these

extremes involved a medical coping strategy that focused on an explanation of why extreme weather was good for the Dutch constitution.

Extreme weather

In the history of European weather and meteorology, the Netherlands always had a special position. Even today, Dutch schoolchildren know about the complaints of the Spanish Duke of Alva (1507–1582), who was defeated by Dutch weather and the wet character of the lands during the Eighty Years' War; Soldiers had to wade through treacherous ditches, artillery got stuck in the marshes and heavy winds regularly blew complete army units off the dikes. During the early modern period, the reputation of Dutch weather never got any better. In the early nineteenth century, professor of theology Petrus Hofstede de Groot (1802–1886) still complained that Europeans tended to mock and despise the Dutch, calling them 'swamp inhabitants on a par with the lowest animals' (1858, p. 1).

Historians and climatologists have similarly noticed that the Dutch were plagued by extremely cold and bad weather.[2] Although they do not agree on exact dates, they call the period between the sixteenth and nineteenth centuries the 'Little Ice Age'. The term was first introduced by the US glaciologist François Matthes in the late 1930s and referred to the advancement of glaciers in the Alps, Scandinavia and North America. Since then, historians have analysed the cold period mainly in terms of demographic and social-economic changes (see Matthes, 1950; Hobsbawm, 1954). Recently, climate historians have acknowledged that the term 'Ice Age' is perhaps inappropriate. The period cannot be characterised as a period of constant cooling for it also saw periods of extremely warm weather. For instance, the summer of 1779 was particularly disastrous. Reports speak of bad drinking water, evil airs and wrinkled fruit and vegetables. The heat led to epidemics and deaths; authorities and medical doctors alike were generally at their wits' end, and it was said that only the businesses of quacks were thriving. Many climate historians now cautiously state that the period of the Little Ice Age should rather be characterised in terms of climatic variability and frequency of extreme events (Gunnarson, 1980, p. 7; Behringer, 2007, p. 86).

Although the eighteenth century witnessed extremely cold winters throughout the century (most notably the years 1740 and 1763), the NASA earth observatory has noted a particularly cold interval around the year 1770. Indeed, the number of newspaper articles reporting on extreme weather doubled during the period 1760–1790. In the Netherlands, the freezing over of the *Zuiderzee* was a particular sign of extremely cold and hard winters. Whenever this happened, people could travel by sledge in one day from Stavoren in Friesland to Enkhuizen in Holland (approximately 20 km) and back. In January 1740, no less than 485 sledges crossed the sea, among them was also a 'woman on a prick sledge' (*Nieuws van de Strenge Winter van 1740*, 1740). The splendour of the Friesian sledges drew 'thousands of people', which inspired the town of

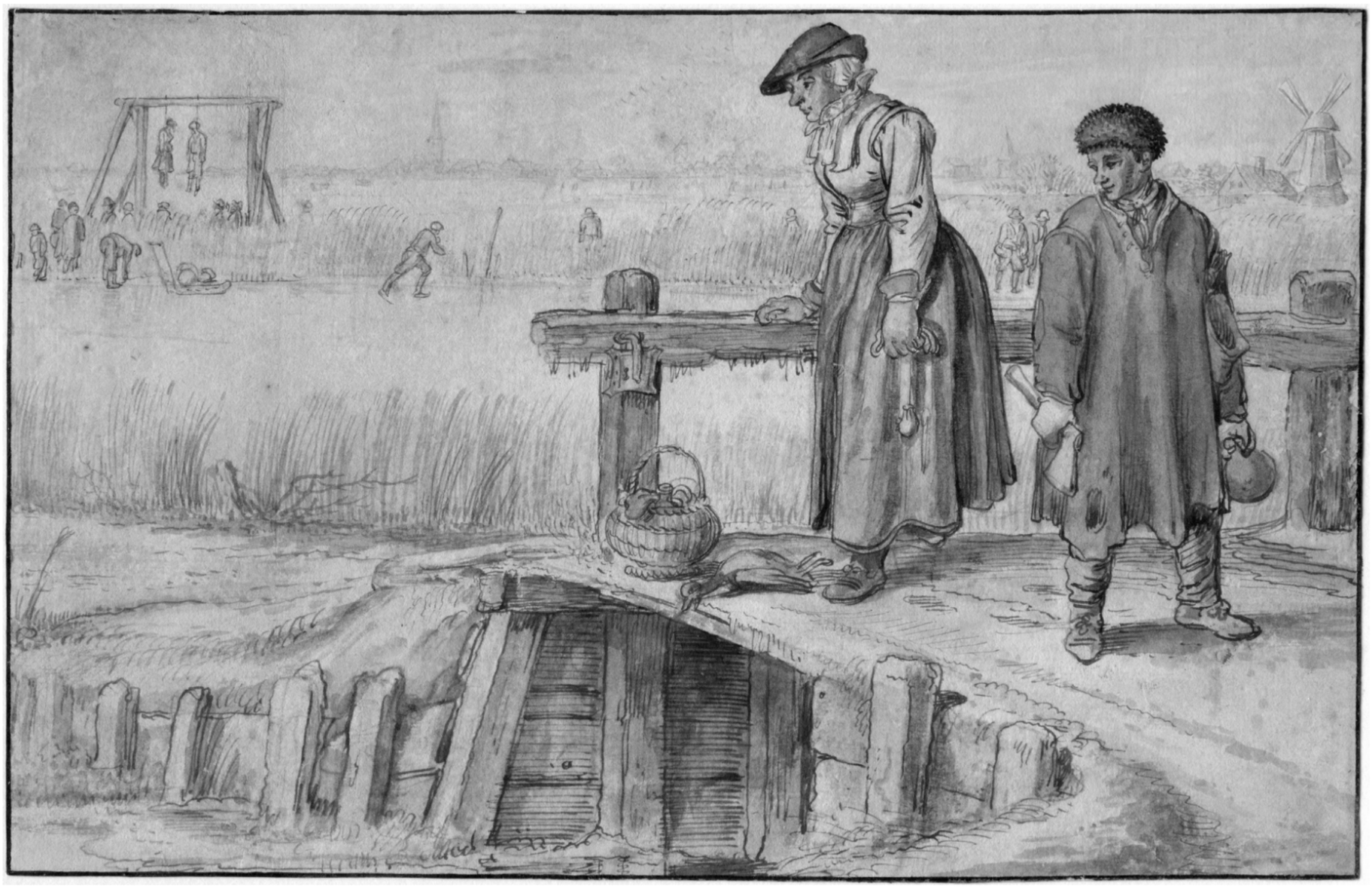


Figure 2.1 Winterview by Hendrick Avercamp, 1595–1634. Courtesy of the Rijksmuseum Amsterdam.

Enkhuizen to organise special fairs with tents built on the ice. It was said that the exuberant atmosphere on the frozen *Zuiderzee* was as boisterous as the general mood at summer fairs. Nevertheless, worries generally dominated reports: drifting ice threatened the dikes and regularly led to severe flooding aggravated by frozen and impermeable grounds; small industries closed due to cold, leading to shortages of food. As a result, poverty and (petty) crime increased ('De strenge winter dezes jaares', 1789). No wonder that many of the famous Dutch winter landscape paintings signal hardship and death in addition to the usual fun images of people on skates and sledges (Figure 2.1).

Cold weather was also a specific medical concern. So perilous was the weather that in his *Medical Institutes* (1708), Dutch medical professor Herman Boerhaave (1668–1738) named it the first threat to health: 'Now the Injuries of Weather, with the sudden necessary and unavoidable Changes in the Air … must have subjected our Species to Disorders ever since they have lived as we do' (1742–1746, § 1.3). Inspired by Ancient humoral pathology, physicians generally associated internal cold with disease and death. In medical textbooks, 'cold' was usually a bad sign. Approaching death could be identified by cold limbs and a cold breath; cold sweats were considered symptomatic of the most dangerous fevers. Heat, on the other hand, was a specific sign of good health. Boerhaave (1668–1738) continuously referred to the importance of heat for sustaining the healthy body. He argued:

> The Ancients observed that a healthy Body was always some degrees hotter than the ambient Air; that this Heat was continued from the very Birth;

> and then found that the Heart was the First Organ that acquired this Heat most, and the last that grew cold or retained it the longest.
>
> (Boerhaave, 1742–1746, § 1.19)

For this reason, anatomists argued that the stomach is purposefully placed directly underneath the heart and is surrounded by the heat of liver, spleen and arteries, so that it can generate the heat necessary for digestion. No wonder that the drinking of cold water was seen as a particular health risk. By the same token, anatomists argued that the coldness of winter makes bones brittle and easier to break (Boerhaave, 1715, § 344).

Although Boerhaave had observed that a healthy body is always hotter than the air surrounding it, he also warned against the risks of 'a heavy cold air', which would impair perspiration and stop harmful particles from leaving the body. Goosebumps were a direct result of this acute closing of the skin's pores: 'by reason of a Constriction in the Pores by Cold, it [the matter to be discharged], therefore distends to the Follicles by its Retention' (Boerhaave, 1742–1746, § 3.424). Boerhaave quoted Venetian physician Santorio Santorio (1561–1636), who had argued that the resulting disorders would kill nine out of ten of the afflicted people. Chilblains and cracked skin were, for the same reason, considered serious medical conditions. Boerhaave argued:

> All the Functions of the Skin depend upon its being soft and pliable, without which it becomes insensible, splits in the Hands, Lips and other Parts, especially when the intense Cold of the Winter has contracted the oily or sebaceous Ducts in such a Manner that they cannot discharge their Contents. The Skin therefore stands in need of being continuously supplied with an Oil.
>
> (Boerhaave, 1742–1746, § 3.424)

Newspapers advertised popular remedies against the effects of cold. From 1734 onwards, wig and sewing shops sold 'French water' (that would keep forever!) for 12 *stuyvers* (the equivalent of 0.50 Euro) as a remedy for chilblains in men and animals (*Amsterdamsche Courant*, 1770).[3] Other 'unsurpassed remedies' relieving 'chilblains on hands, heels, fingers, and even very hard and cracked skin where cold has taken a seat' were also sold by apothecaries in cities throughout the country, from Middelburg to Amsterdam to Nijmegen.[4]

Extremely cold air and walking through snow also led to 'fatal sleep'. Boerhaave himself had experienced this in 1709 in a coach on his way to see a lady who had broken her leg two miles away from Leiden:

> The winter was extremely severe. … [B]oth myself, the Surgeon and Coachman were seized with such a Sleepiness, accompanied with such an inexpressible Pleasure, that they would certainly have fallen Victims to the fatal Pleasure, if I had not been aware of the Danger, and advised

> my Companions to get out of the Coach and stir their Blood by walking; by which means the Sleepiness was shook off, and everyone came to himself.
>
> (Boerhaave, 1742–1746, § 4.591)

Death by cold happened frequently in the Netherlands. A report on the extreme winter of 1740, when the 'birds fell dead from the sky', states that everyone was at risk every day:

> Many people froze to death in their houses, because of lack of headwear. Others lost limbs which froze to death. Others froze to death on the move from one place to another, arriving dead, sitting stiff and with open eyes on their sledges. Also, couriers arrived dead and stiff on their horses and sentries froze to death standing on their posts.
>
> (*Nieuws van de Strenge Winter van 1740*, 1740)

Similar reports appeared throughout the eighteenth century, often using the same wording. But, as Boerhaave stated, the effects of cold could easily be reversed by muscular motions of the body. In particular, 'skating against the wind' was considered a very healthy exercise, 'for in this Case, the Solids act violently upon the Humours, so as to generate Heat by Attrition, which overcomes the external Cold' (Boerhaave, 1742–1746, § 5.747). Boerhaave's reference to skating as a remedy against cold ties in with the skating reputation of the Dutch. A foreign gentleman visitor remarked in 1695 that 'the Dutch skate so fast – they can bridge a distance of 6 miles in 1.5 hours, without getting tired' ('Op een met varkensreuzel ingevette Osseschenkel', 1982).[5] And in the winter of 1763/1764, Pieter Koopman, the Mayor of Bolsward, allegedly skated from Den Haag to Leeuwarden in one day in order to deliver a letter from Stadtholder William IV to his mother Maria Louise.[6]

Yet, paradoxically, although Boerhaave considered 'internal cold' a sign of bad health, he simultaneously believed that cold weather was a blessing. He argued that winter is healthier than summer, for cold and ice close off the surface of the earth so deadly vapours cannot rise to the surface. During summer, these same vapours were considered a major threat (Boerhaave, 1742–1746, § 1.3). He also quoted Hippocrates' statement that in winter and spring, the viscera are warmer and digest better. This has to do with the fact that when it is cold, people generally eat and sleep better. More importantly, Boerhaave argued that when cold air takes away the body's warmth, the vital powers have to work harder in order to generate internal heat. It is evident, he reasoned, 'that the power of the arterial system must be at that time great, and capable of circulating the humours through the body with a sufficient degree of motion' (Boerhaave, 1742–1746, § 3.428, 3.430). Moreover, cold and freezing air, although it thickens and condenses the humours, leading to shortage of breath, coughs and colds, also shortens and strengthens the fibres, which increases their action upon the humours (contrary to heat which dissolves and destroys the

fibres) (Boerhaave, 1742–1746, § 5.747). Hence, the Dutch are healthiest and strongest in the severest of winters.

Boerhaave's argument differs from the climatic susceptibility which troubled Enlightenment British writers. In the early decades of the eighteenth century, dull and damp weather was thought to cause widespread melancholia and other nervous disorders, which were further aggravated by luxury lifestyles. Diseases of the air, so historian Jan Golinski argues, were to a certain extent related to moral decline and considered diseases of modern life (2007, p. 138). In other words, sensibility to the weather (which dovetailed with the general Enlightenment sensibility 'epidemic') became a marker for social and cultural change. The British increasingly felt that their increased sensibility was making them vulnerable to atmospheric dangers, a concern that was particularly urgent in urbanised areas. Engineering projects were set up to improve ventilation in closed-off spaces, to remove stagnant waters and to move cemeteries outside the city walls. Furthermore, pneumatic chemistry and eudiometry, the technology to measure the virtue of air, inspired the meteorological recommendations for better management of body and society put forward by Joseph Priestley and Jeremy Bentham (Schaffer, 1990).

While the English were particularly concerned with pathogenic air in urbanised areas, the Dutch mainly worried about land and water management and the continuous threat of devastating flooding. In fact, for centuries the constant fight against the water has been an important factor in the forging of Dutch national identity (Jensen, 2018). The medical framing about typically Dutch weather (cold, wind and rain) in terms of strengthening Dutch bodies must be seen in this context.

The noxious powers of the atmosphere

At the root of Dutch Enlightenment medical thinking about body and climate was the work of the German-born Leiden professor of medicine Hieronymus Gaubius (1705–1780), who explicitly mentioned the 'noxious powers of the atmosphere' as an important cause of compound diseases. 'That fluid the air', Gaubius argued, is everywhere around us and we are continuously and greatly affected by the 'diversity of its powers and qualities'. Moreover, since 'the atmosphere' also permeates the human body and in this way directly communicates with the body's inner working, Gaubius pointed at meteorological observations as the best way to study the effects of air on the body (1778, § 422, 440).

Gaubius is hardly known among historians of medicine (perhaps because of the dominant attention for Boerhaave's British followers). Yet, he was one of Boerhaave's most influential pupils. Not only did Gaubius study with Boerhaave, he also followed Boerhaave in the chair of chemistry after the latter resigned from the post in 1729. After Boerhaave's death in 1738, Gaubius also took on the chair of theoretical medicine. Gaubius had high regard for Boerhaave, but his teaching differed from Boerhaave's in one important aspect.

While Boerhaave mostly taught the physiology of the healthy body, Gaubius directed his student's attention towards pathology. In 1758, he published his *Institutiones Pathologiae medicinalis* (1758), in which he proposed the chemical investigation of organic compounds as an important basis for medicine. His textbook was translated into most European languages and remained a standard reference work until far into the nineteenth century. For instance, German physician Rudolph Virchow (1821–1902), well known as the founder of cellular pathology, used it while being a medical student in Berlin in 1839.

Gaubius' pathology is built on the premise that health and longevity are determined by a 'threefold genus of powers'. First, a mixture of inertness, mobility, mutability and excitement peculiar to each part of the body is at the basis of health and disease. Second, the mind assists health and the preservation of life through voluntary consent and a 'secret instinct'. And three, 'a variety of things', outside the body itself, affect the internal powers of body and mind. Among these 'things', Gaubius listed noxious airs, aliments, poisons and remedies. To make things easier, Gaubius later translated the 'threefold genus' into a dichotomy between body and mind on the one hand and the Hippocratic non-naturals, or intermediate powers, on the other. The latter are neither natural or unnatural, salutary or noxious, but they might become so through their use or abuse (Gaubius, 1778, § 419). In Hippocratic fashion Gaubius argued that it is the task of the physician to direct the non-naturals, in line with the laws of nature, for the preservation of health (1778, § 4–8).

The interaction between body and mind on the one hand and environmental factors on the other is also evident in Gaubius' theory of disease. He argued that for a disease to manifest itself, two things are necessary: first, the seed of a disease (present within the body) and second, a 'noxious power' affecting the body from outside. Gaubius called the latter the predisponent and procatartic, or occasional causes. Both the seed of a disease and a noxious power have to be present at the same time, which means that a noxious (or harmful) power on its own is not necessarily harmful for the body. It depends on the individual constitution or temperament of the body, and thus on things like sex, age and natural environment, whether a person will be affected. This theory of disease explains why, according to Gaubius and many of his contemporaries, diseases manifest themselves in many different and individual forms, and that unravelling causes and cures is a complicated business.

Gaubius advised physicians to disentangle a disease in its simplest parts for which he considered it necessary to know the nature of every latent seed or disposition inherent in the body and the noxious powers threatening health from outside (1778, § 79). In addition, Gaubius argued that it is necessary to understand the latent powers of sympathy, antipathy and affections. They keep the parts and faculties of the human machine together and assist its self-healing capacity (Gaubius, 1778, § 123). Gaubius emphasised the necessity of using chemical analysis in understanding the nature of the solids and the fluids of the body as well as their particular properties and powers. Any kind of disease, so Gaubius claimed, 'will be more fully understood, if these things which are

demonstrated in chemistry concerning the constituent matter of the human body (*materie corpus humanum constituent*) are first premised' (1778, § 129).

Thus, contrary to Boerhaave, who in his *Institutiones medicae* had emphasised mechanical physiology and the solids (vessels and organs), Gaubius gave much more attention to chemistry and the humours. He stated that 'we learn from chemistry, that the greatest part of the body consists of fluids' (Gaubius, 1778, § 265). In fact, Gaubius' chemico-mechanical pathology of the fluids seamlessly fits the eighteenth-century reinvention of Hippocratic humoral pathology. This was also noticed by early nineteenth-century doctors. For example, J.S. Thorburn, medical doctor and author of *Elements of Bedside Medicine* (1836), often quoted Gaubius, but with respect to Gaubius's discussion of the bodily fluids, he accused Gaubius of 'losing himself in the murkiness of humoralism' while 'gravely discussing the mechanical, as well as the chemical acrimony of the humors' (1836, p. 307).

It is, however, difficult to define Gaubius as a straight humoralist. Ever since writing his dissertation on the solid parts of the body (*Specimen inaugurale medicum exhibens ideam generalem solidarum corporis humani partium*, 1725), Gaubius argued that the distinction between solids and fluids is not a distinction of sorts, but of degree, depending on the combination of elementary (watery, saline, inflammable and earthy) particles, and the strength of cohesion and other vital powers keeping them together. This implied that although he acknowledged that the (angular) shape and hardness of a particular substance could cause mechanical erosion of the humours, he nevertheless maintained that the turning of angular into spherical shapes 'is effected rather by a chemical mixtion than by a mechanical rotundation' (Gaubius, 1778, § 300). By extension, only the nature and vital powers of elementary particles could 'infect the fluids', in particular when assisted by an increase in vital motion and body heat. Gaubius described these particles as 'external things' that 'steal into' the pores and orifices of the body 'in a mild form and in disguise'. Once inside, they fully assume their own harmful nature corrupting the fluids. Again, this is a chemical, rather than mechanical process, for these outside acrimonies cause trouble through the chemical operations of 'internal corruption, mixtion and separation' affecting the body's vital solids (*solida viva*) and the processes of concoction, secretion and excretion (Gaubius, 1778, § 289–305).

In short, in Gaubius' pathology, the porosity of the body, together with the strength (and sneakiness!) of invading particles, makes the body susceptible to disease. This was of course obvious in the case in nutrition, for eating the wrong things directly introduced harmful particles into the humours. But Gaubius considered 'a rottenness of the air', the wrong temperature or humidity and sudden changes in the gravity of air equally destructive. In fact, since 'that fluid the air is everywhere perpetually in contact with the external and internal surface of our body' and we are 'variously affected according to the diversity of its powers and qualities', Gaubius first of all discussed the 'noxious powers of the atmosphere' even before considering the 'injuries of meat and drink'.

Gaubius starts off his discussion with the seasonal effects of the duo's heat and cold and moistness and dryness. In Hippocratic/Galenic fashion, he relates these to differences in age, sex and natural environment, while at the same time underpinning this classical humoral pathology with the chemico-mechanical theories of his own time (Hippocrates, 1978; see Jouanna, 2012). Thus, hot air penetrates the body, and it rarifies and relaxes the particles. While this is a good thing in old age, it is less so in youth for it loosens internal cohesion; it promotes fermentation and putridity and leads to a loss of vital power. Cold, in contrast, condenses and contracts the body. It decreases the vessels, which in the weak and inactive leads to stagnation of the humours. Consequently, the vigour of the circulation is diminished and the innate heat and vital powers decline. Evacuations are suppressed, and the body becomes overcharged with humours, which leads to scurvy, rheumatism and dropsies. Eventually, it affects the heart and lungs and if nothing is done can lead to sudden death. In strong and robust bodies, on the other hand, the constricted vessels and a sense of cold stimulates exercise, leading to an increase of vital power. The only danger is that if the sharpened appetite (resulting from an urge to repair bodily supplies) is not satisfied immediately, one might die of hunger (Gaubius, 1778, § 430). Most importantly, heat and cold directly affect the vital powers of the body; they generally decline in great heat but are stimulated by cold. The vital powers are likewise affected by humidity. Moist air suppresses perspiration and so causes serous congestion, which, particularly in combination with cold, leads to colds, pneumonia, fever and rheumatism (Gaubius, 1778, § 429–430). Dryness causes the opposite and makes bodies sapless and rigid. On the whole, however, dry air is salutary in cold climates.

Although Gaubius maintained that neither extreme heat nor extreme cold are good for health, like Boerhaave, he is warier of the destructive effects of heat. No wonder, Gaubius had lived in the Low Countries from an early age and he was used to the challenges of low-lying windswept lands, characterised by moderately warm summers and cold winters. According to the Hippocratic treatise *Airs, Waters, Places*, the inhabitants of such places have strong bodies and characters. Gaubius likewise believed that moderate cold and the omnipresence of wind, continuously renewing and refreshing the air, suited the Dutch constitution and was generally beneficial to health. And it was this belief that Dutch doctors, on a large scale, adopted in medical arguments and treatises on the wholesome effects of Dutch weather and the position of 'the Fatherland'.

Dutch constitutions

Towards the end of the eighteenth century, Dutch medical optimism about individual and national health in spite of 'bad weather' went hand in hand with a societal concern with prevention and the manipulating of environmental conditions. In 1770, the Dutch Society of Sciences, in an essay competition, questioned which illnesses are related to the 'constitution of our

fatherland' and how they could be treated and prevented. The Hague doctor Iman van den Bosch (1731–1788), a disciple of Gaubius, won the competition with an essay *On the Illnesses of the Fatherland* (*Over de Ziekten van het Vaderland*, 1778).

Van den Bosch argued that humidity combined with the changing of winds and seasons often is an important cause of disease. In the Low Countries, wetness in the air prevents healthy perspiration and damp housing, often in combination with lack of exercise, which weakens the fibres. Van den Bosch also pointed at other factors which aggravated the situation. For instance, the Dutch habit of daily scrubbing doorsteps and floors, thereby using a lot of water and taking off shoes and stockings, increased the general humidity and made the Dutch even more susceptible to disease. Yet, even though the Dutch live under unfavourable climatic circumstances, van den Bosch remarked that the Dutch constitution was thriving regardless. He pointed at famous seventeenth-century Dutch paintings of civic guard companies, 'to be seen everywhere in the Netherlands', which show the general health of the Dutch population: 'Health in all its strength could not be better represented' (van den Bosch, 1794, p. 48) (Figure 2.2).



Figure 2.2 The oath taking of the Society *Pro Aris et Focis* (one of the three civic guard companies of the town of Haarlem) in the *Oude Doelen* in Haarlem, 5 April 1787. Note the paintings of 'healthy' civic guard companies at the wall. Courtesy of the Rijksmuseum Amsterdam.

Van den Bosch, moreover, repeated Gaubius to the effect that:

> our bodies, doubtless, by nativity and custom, are muted not only to bear with impunity, a malignant air, but, when once accustomed to it, endure it better than one comparatively more salutary, to which they have not been accustomed. The inconsistence and frequent variations of the air itself often prove the means by which a noxious power is blunted.
> (van den Bosch, 1794, p. 115; see Gaubius, 1778, § 445)

So, paradoxically, van den Bosch argued that the Dutch constitution was made for bad weather, and that instead of it being weakened, it was strengthened by the effects of cold and humidity. To strengthen his argument, van den Bosch pointed at the Batavian forefathers who, in Roman times, when both Tacitus and Pliny had agreed that the Dutch lands were nearly inhabitable on account of bogs, flooding and cold, still thrived. Van den Bosch argued that the Batavians were a rough people, with giant bodies able to cope with the inconveniences of air and weather. Moreover, the difficult circumstances of Batavian *airs and places* inspired hard work and chastity: people married late, prostitution was unknown and mothers nursed their own children. Since these tough people gave birth to strong children, their Dutch posterity necessarily had a robust constitution. Van den Bosch pointed at unnecessary luxuries and unhealthy lifestyles as a danger to inbred Dutch strength and, unlike the British, he firmly denied that 'unfavourable' Dutch airs and places had anything to do with the eighteenth-century welfare diseases of melancholy, inertness and fatness. According to van den Bosch, the best proof of this fact was that people in Dutch towns generally died of old age rather than a disease:

> compared to the total number of inhabitants of the town of GRAVE many people were 70, 80 or 90 years old. … [M]ost old people in the town of SLUIS die without ever having been ill, in particular during winters when it is very cold they only die of old age. … [I]n BEVERWYK the people are healthy, well-built, strong and fertile, there are people of 80 and 90 years old, but of 100 years and older are rare.
> (van den Bosch, 1794, p. 46)

Van den Bosch' argument was in line with a typical Dutch reasoning about the health benefits of typical Dutch rainy, cold and stormy weather. For instance, in 1672 professor of medicine Wouter van Doeveren (1730–1783), also a student of Gaubius, elaborated on this theme in his oration *On the Favourable Situation of Groningen for Health* – a Groningen interpretation of Hippocrates' *Airs, Waters, Places*. Van Doeveren argued that Groningen is lucky in its location, for compared to the towns of Amsterdam, Leiden, Rotterdam, The Hague and Leeuwarden, it is much healthier. The air, van Doeveren stated, contains a 'life food or hidden nourishment of nature'. This air easily blows through the broad streets and over the large squares. The winds not only bring in healthy

air, but also blow away bad vapours from the town. This also goes for rain, which does not cause disease, but instead cleanses the air of bad particles and washes rubbish off the streets. As van den Bosch stated: 'the more water falls, the fewer diseases there are' (1794, p. 131). Furthermore, it is never unbearably hot in Groningen. The cold air of the town contracts the body's fibres, it prevents rotting of the bowels and kindles the internal heat. All this improves the body's strength. Complaining about the weather, so van Doeveren argued, should not be allowed: 'those who often complain about this [the weather] are at a loss; severe cold is not harmful, but rather beneficial to health'. Van Doeveren ends his oration with some recommendations to the burgomasters. In his advice van Doeveren, just like van den Bosch, separated the weather from diseases resulting from luxury lifestyles. He advised the burgomasters to check and improve the state of gutters and sewerage to optimise the beneficial effects of the Groningen location and weather. By the same token they should move dirty factories and graveyards outside the city walls, for they infest the air with unhealthy particles. Above all, van Doeveren urged the burgomasters to discourage unhealthy behaviour that results from excessive riches.

Similar arguments were put forward by Paulus 's Graewen (1715–1779), who followed van Doeveren in the chair of chemistry and medicine in Groningen. In his *De frigoris aëris, in promovenda laedendaque sanitate* (1774), 's Graewen stressed the therapeutic effects of cold air in cases of impaired health. The Groningen professors, in other words, repeated the Boerhaavian theme that during winter and spring, the body's vital powers produce motion and generate more heat than in summer. This is a good thing, for cold leads to better circulation of the humours and a contraction of the body's fibres promotes strong and healthy bodies (Boerhaave, 1742–1746, § 3.430, 5.747).

Years later, Petrus Hofstede de Groot still argued that the Dutch lands and atmosphere are advantageous to health and morality; they were of particular benefit for its citizens to reach a 'happy old age'. For instance, referring to many reports on disastrous thunderstorms, Hofstede de Groot argued that severe lightning does not signal a vengeful God but a benevolent God sending lightning in order to clean the air of harmful particles, and in doing so he strengthens the lives of the people. Hofstede de Groot also positively remarked on severe winters, such as the winter of 1740. For although extreme cold led to casualties, that same cold also chased out epidemic fevers and killed the pile worms threatening the stability of the dikes. Furthermore, Hofstede de Groot argued that the unfavourable position of the lands (below sea level, full of swamps and mist) makes the inhabitants co-operative, tolerant and inventive. No wonder, so Hofstede de Groot exclaimed, have the Dutch been famous for their discoveries and technical inventions. Time and again, Hofstede de Groot argued that 'precisely the unpleasant and in many respects unfavourable situation of our Fatherland provides peculiar advantages' (1858, p. 3).[7]

Yet, despite the general optimism about the beneficial effects of cold, rain and wind, Dutch doctors were still worried about the harmful effects of stagnant air, humidity and northern winds. In an attempt to control the effects of

bad air, they set up large observational networks aimed at registering the quality of air and weather in individual towns. After winning the essay prize competition in 1778, Iman van der Bosch was one of the founding members of the *Natural and Medical Correspondence Society* (established in The Hague in 1779). The main activity of the *Society* was the creation of a 'database' that combined weather observations with birth and mortality rates and details about health and well-being: citizen science *avant la lettre*! The *Society*, observing 'the rules of the Founder of Medicine Hippocrates', counted approximately 500 active correspondents throughout the country. In an effort to create unity in the mass of observations, the correspondents were carefully instructed about the use of instruments and they were asked to use a particular format for noting their observations. These standardisation efforts are typical for the late eighteenth-century coordinated observations cultivated by Enlightenment naturalists, when, as Lorraine Daston has argued, 'observation had become a tool to think with, a genuine logic of discovery and proof' (Daston, 2011, pp. 81–114). However, without the aid of statistical methods, the *Society* was soon flooded with seemingly unconnected observations. Combined with financial troubles and irregular correspondence, this eventually led to termination of the Society in 1793 (Snelders, 1981; Huisman, 1997; Zuidervaart, 2006).

An important reason for establishing the Society was Van den Bosch' essay *The Illnesses of the Fatherland* and the conclusion that the essay had not covered every 'air and place' in the Netherlands. The latter was important: as Iman van den Bosch argued, the omnipresence of the North Sea, great differences in effluvia rising from bogs and peatland and the ever-changing winds, caused a strong changeability of the weather and local extremes even between neighbouring towns. This awareness led to the following programmatic reasons for establishing the Society:

1. To establish fixed rules that linked particular diseases to environmental conditions. This was considered particularly useful in relation to population growth, the increasing traffic, and in the military. Moreover, it would chart the different kinds and spreading of rotten fevers (*rotkoortsen*), as well as the rise of diseases formerly unknown to the Netherlands.
2. To communicate about health and environment in the vernacular in order to educate broad medical audiences. The correspondents optimistically believed that their observations would lead to fixed rules for preventing epidemics, it would show the usefulness of inoculations as well as the importance of local physic for local diseases (such as the use of white willowbark from Harderwijk against fever).

(*Verhandelingen van de Natuur- en Geneeskundige Correspondentie Sociëteit*, 1794, pp. cvii–xviii)

From this it appears that although meteorological observations were at the heart of the correspondence, the aim of the Society was medical. This is also visible in the Society's emblem: above the motto *Mutua praestant officia* (they offer

mutual help), Aesculapius, the god of medicine, shakes hands with Alexandrian astronomer Ptolemy.

Central to the observations of the Society was the use of a barometer, which correspondents were required to check three times a day (at 6 or 8 am, 1 or 2 pm and 10 or 11 pm). This was not surprising. Historian W.E. Knowles Middleton has argued that the history of the barometer is related to technical progress and as such different from the history of the thermometer which is related to academia and scholarly debates about the establishment of the various scales of temperature (1966, p. v).[8] In other words, the thermometer mainly functioned in the scholarly domain, while the barometer was related to arts and crafts and more readily available to gentlemen outside learned circles. This distinction is also visible in the Society's instructions. Correspondents were generally encouraged to fabricate their own instruments. However, the Society only gives detailed instructions for the making of a barometer, which suggests that a barometer could be made by anyone, whereas the making of a thermometer should be left to specialists.

Even more, not only was the barometer a fashionable and easy to make instrument, unlike any other instrument, the barometer mediated between the inside body and its surrounding atmosphere. This means that it not only predicted the weather and related (epidemic and localised) diseases, the body itself was also considered a barometer to which the Hippocratic doctor should listen in order to prescribe the right treatments.

The body is a barometer

In his pathological textbook, Gaubius introduced the barometer as an instrument that simultaneously measured the outside as well as inside atmosphere of the body. Again, the porosity of the body was key. Gaubius built on Boerhaave's idea that the air is not only everywhere around us, but also mixes with all bodies; 'nothing lives, grows or acts without it' (Boerhaave, 1732, p. 1.104). Likewise, in Gaubius' pathology the outside atmosphere easily penetrates the body and so becomes part of the most important operations of the body. This means that whatever the barometer indicates about the weather surrounding the body has a direct bearing on the physiology of the interior body. Gaubius stated:

> Hence the atmosphere, where it *surrounds and penetrates* the human body, presses it equally in every point in the manner of fluids, sustains and corroborates the solids, applies the containing parts close to the contents, assists the natural actions between these and their attrition, preserves the diameters of the vessel, and confines the humours, that they may not suffer aberration.
>
> (Gaubius, 1778, § 433)[9]

> Seeing the gravity of the atmosphere … much varies, the pressure of our bodies therefore, *proportioned to this*, must likewise be very various. Is it

> readily understood … why the barometer prognosticates relief, or uneasiness to asthmatics?
>
> (Gaubius, 1778, § 437)[10]

So, a diminished gravity of air, which usually predicts rain, storms and 'bad' weather, is directly mirrored in the body where a low atmospheric pressure has pernicious effects. It deprives the solids of support, it weakens the elasticity of the body and slows down the circulation, leading to a corruption of the humours. The lungs are affected worse, for in the lungs the atmospheric air and the interior air pressure most closely connect. Dilated blood vessels in the lungs, resulting from a dropping of pressure, lead to an accumulation of blood and causes laborious breathing, pneumonia and coughing-up blood (Gaubius, 1778, § 435). No wonder, Gaubius makes particular reference to asthmatics and others suffering from pulmonary complaints; they were most helped with a barometer in their household.

It follows that for Gaubius the barometer was a medical instrument measuring and predicting the chemico-mechanical effects of air pressure upon the fibres and inside the vessels and fluids of the body. And in Gaubius' pathology hardly anything was more important, for 'the vital function of circulation, respiration, the native heat and health' depended on it (Gaubius, 1778, § 433). Gaubius' ideas must have fallen on fertile ground for the idea that 'man is a living barometer, its quicksilver rising and sinking, after flattery of the gods of lust and desire' was often used in eighteenth-century literature (Weyerman, 1726, p. 2.145). Moreover, already, during the early eighteenth-century Dutch Enlightenment writer Jacob Campo Weyerman (1677–1747) mentioned the popularity of barometers ('more *à la mode* than punctual payment, a merchant's word, or modesty in youth') which prompted Weyerman to speculate about the desirability of having a similar instrument that would measure the rotten atmosphere surrounding a diseased body. Such an instrument would, he believed, aid the doctor in predicting the course of a disease (Weyerman, 1720, p. 340). From the 1740s Italian craftsmen moved to the Netherlands and set up a 'mass production' of fashionable barometers. Well-known are the Italian Lurasco brothers, who sold clocks, barometers, thermometers and watches in Amsterdam from 1795. Towards the end of the century, barometers adorned the hallways of many prosperous Dutch households (Figure 2.3).

Ironically, however, the people who most needed a barometer (i.e. farmers) often could not afford one. Rooted in the idea that natural bodies are like barometers, they were advised to observe barometric changes in animals and plants. Dutch writer Jan Floris Martinet (1729–1795) recommended that 'the eel is a cheap barometer for landworkers'. Martinet spoke from experience, for on his desk he kept a Conger eel in a glass flask. He never fed the eel, nor changed the water. He had observed that 'in fair weather, the eel lies unmoving, but when the weather is about to change into storm, it is restless and swims around in the glass' (Martinet, 1777–1779, p. 1.324). Not only the animal body of the eel was susceptible to changes in the air, Martinet argued that



Figure 2.3 Man with barometer. Johann Heinrich Maria Hubert Rennefeld, after August Allebé, 1748–1877. Courtesy of the Rijksmuseum Amsterdam.

plants likewise feel changes in the weather. In his extremely popular and often translated *Katechismus der natuur* ('Catechism of Nature', 1778–1779) he stated that the Creator has given sensitivity to plants, which is like a barometer. The plants can prepare for cold weather and we can see in plants when the weather is about to change (Martinet, 1777–1779, p. 1.288). Not surprisingly, the idea that we can experience weather changes inside the human body was not at all alien to eighteenth-century man.

Jan Golinski has argued that during the eighteenth century, weather instruments were often seen as continuous with the experiences of the human

senses, in particular when air pressure and particles in the air affected the people's health and mood. He states that 'the human body itself was sometimes thought of as an instrument, because of the unconscious environmental susceptibilities that the use of the new devices had revealed' (Golinski, 2007, pp. 109–110). Golinski follows the work of other historians who have traced the role of bodily cognition in natural philosophy from the seventeenth century onwards. Experimental philosophers increasingly considered a human body, in particular its trained and disciplined sense perceptions, as an instrument, thereby blurring the distinction between corporeal and material machinelike devices (Bourguet, Licoppe and Sibum, 2002, p. 7; see Smith, 2004; Wolfe and Gal, 2010). However, Golinski implied that the British mainly considered the body barometer in a metaphorical sense. Dutch medical sources suggest that medical doctors understood the body as a barometer in a literal sense. In this they were closer to the German Brunonian system which advocated that 'the organisation of the body is merely employed as a barometer, to be raised or depressed … by the stimulant atmosphere of their exciting powers' (Morrison, 1806, p. 96).

For instance, Johan Macquet (1731–1818), disciple and friend of Gaubius, wrote in his pathological textbook *Introduction to Pathology, or Description of the Body in Diseased States* (Utrecht, 1781):

> If someone, whose body is a barometer, who immediately experiences changes in the weather, asks you: Doctor, why is it that I immediately experience these changes? What is the reason that, even when lying in bed, I can feel the wind move towards the north? With a doctoral dignity, he receives the following answer: My dear Sir, it is because the oily particles in your blood are elastic. They expand or constrict with changes in the weather, and upon feeling these changes, you will know the direction of the wind, even in your bedroom, just as a barometer or a thermometer.
>
> (Macquet, 1781, vol. 2, p. 429)

Berryat's two patient reports mentioned at the beginning of the chapter were also often quoted in arguments about the usefulness of barometric observations in medicine. Van den Bosch even argued that the body barometer is more trustworthy than observations made with the instrument itself (1794, pp. 570–571).

While Gaubius, Macquet and Berryat ascribed the remarkable similarities between barometric changes and bodily complaints to changes in air pressure, other physicians speculated that 'the electric state of the atmosphere' produced changes in the animal functions. In 1777, a correspondent of the *Vaderlandsche Letteroefeningen* ascribed the working of the body barometer to the presence of an electrical fluid in the air. The writer of the article furthermore speculates that this electrical fluid is perhaps the principle of life. It permeates everything in nature, not only the quicksilver of the barometer, but also the human body.

It follows that the human body as well as the barometer register upcoming changes in the weather:

> If the barometer predicts changes in the electric fluid in the surrounding air, and this fluid is also the cause of the circulation of fluids in the body, and above all of the circulation of the nervous fluids … it follows that strong people, before the quicksilver in the barometer falls, feel even more acute the lack of this fluid. They feel slow and drained and they complain of acute rheumatic pains.
>
> (De Rocaut, 1777, pp. 535–536)

However, in discussions on the question which instrument was best suited to measure atmospheric electricity, the barometer quickly fell out of favour as the new and fashionable electricity machines appeared much more promising in their results. In 1779, Mr. Changeux denied that electricity had any influence on the working of the barometer and he ascribed barometric changes to fluctuations in atmospheric pressure (Changeux, 1778, pp. 632–638).

Conclusion

Today we are still concerned with the question of how climate, with its (sudden) changes in temperature, humidity, winds and atmospheric pressure, affects health. Weather apps predict not only the weather, but also our chances to be afflicted by smog, pollen and other allergens in the air. It is also widely acknowledged that many people experience symptoms (e.g. changes in blood pressure and sugar levels, migraines and joint pain) that dovetail with barometric changes.[11] Also more serious medical news outlets, such as *Medical News Today* (a web-based news outlet for physicians and the general public) or *Johns Hopkins Health Alerts* (a cooperation between Johns Hopkins Medicine and a consumer website), have discussed the question of whether climate affects arthritis, headaches etc., even though scientific studies show contrary results (Savedge, 2016; see Ray, 2013; Huizen, 2017).

Yet, even though the body barometer is very much alive in today's popular discourse, it is hardly a serious medical issue. Although recent worries about climate change have placed weather higher on the scientific agenda, weather is nevertheless mainly constructed as 'a statistical index of averaged parameters across space and time' (Fleming and Jankovic, 2011, p. 1). It is not seriously seen as something that affects individual bodies. Our climatised and ventilated housing has diminished the immediate effects of extreme temperatures and damp and rather than attributing a cold to the weather we now believe that it is caused by a virus.

Eighteenth-century medical doctors, on the contrary, were much more serious about medically explaining the remarkable connections between the weather and health. Historians Fleming and Jankovic have recently claimed that early modern scholars viewed climate descriptively as a human experience related to the social and natural circumstances of local environments.

In addition, eighteenth-century natural philosophers gave agency to climate in its production of seasons, endemic diseases, diet, customs, and political organisation (Fleming and Jankovic, 2011, p. 2). Eighteenth-century weather, in other words, was part of a lived experience; it determined how people felt, the health of their bodies and how their constitutions were grounded in the lands they inhabited. Eighteenth-century climate, in sum, was more than a metaphor signifying emotional states. The body barometer signifies that climate was part of the Enlightenment body itself.

Notes

1 On the centrality of the fibre in eighteenth-century medicine, see Berg (1942); Cheung (2010).
2 For a detailed, day-to-day historical overview of eighteenth-century Dutch weather, see Buisman (2006, 2015).
3 Similar advertisements appeared throughout the eighteenth century. Interestingly, the price of 12 Stuyvers never changed.
4 See for example, *Oprechte Haarlemsche Courant* (1770). Similar advertisements appeared throughout the eighteenth century.
5 An eighteenth-century Dutch mile usually equals 'one day's walk'. This means that the Dutch skated approximately 20 km per hour.
6 The story is based on a newspaper report in the Leeuwarder Courant, which stated that 'a certain gentleman from Bolsward left the Hague yesterday morning at five o'clock, skating all the way to Leeuwarden and arriving that same evening at six thirty' (1763). Based on this report, different versions of Pieter Koopmans' heroic trip have been told. Historians do not doubt that Koopmans could have skated the distance from The Hague to Leeuwarden. However, William IV had already died in 1751 and his son William V was under age, which make the details of the account highly unlikely.
7 This argument, of course, fits into a well-accepted and interdisciplinary discourse on resilience and triumph in the face of adversity.
8 For the history of the thermometer in scholarly work, see also Chang (2004) and Powers (2014).
9 My italics.
10 My italics.
11 For instance, the popular weather map AccuWeather offers Health Weather forecasts that map your chances to get migraine, arthritis, asthma and other afflictions.

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3 Hot climate and health care

Tropical regions in the Dutch Atlantic, c.1600–c.1800

Stephen Snelders

> "When Europeans avoid excesses and make proper use of the res non-naturalia they too could remain healthy in the tropics."
>
> Dutch surgeon Abraham Titsingh, 1752

Introduction

When from the 1590s onwards the maritime, commercial and territorial expansion of the newly founded Dutch Republic got under way, its adventurers, merchants and soldiers were confronted with the problem of staying healthy in what were for them uncongenial climates. In the course of the seventeenth century, the WIC (the Dutch West India Company, founded in 1621) began to control territories, settlements and plantations in different regions of the Atlantic world situated in the so-called "hot" or "warm" climates – the tropics. These tropical colonies included a dozen fortresses on the Gold Coast of West Africa (in present-day Ghana) and six more on the Slave Coast further south (in present-day Gabon and Angola); six Caribbean islands, of which Curacao and St Eustatius were the most important in the seventeenth and eighteenth centuries; plantation colonies in the present-day republics of Suriname, and Guyana (Essequibo, Demerara and Bernice) on the north coast of South America; and for a short period between 1630 and 1654 cities and other territories in north-eastern Brazil. Together, these colonies constituted the "Dutch Atlantic": a commercial empire based on the transatlantic triangular trade carrying manufactured goods from Europe, slaves from Africa and cash crops from the Caribbean (Postma and Enthoven, 2003; Den Heijer, 2013; Enthoven et al., 2013; Oostindie and Rothman, 2014).

In the hot climates, the Dutch and other Europeans – whether in the service of the WIC or sailing on their own account – had to deal with health problems that they specifically related to the hot air typical in the tropics, just as their counterparts in service of the Dutch East India Company with its settlements in South Africa, India, Ceylon, Indonesia, Malaysia and Japan did. These adventurers were plagued by all kinds of fevers, by diarrhoea (the "flux" or in Dutch *loop*), dysentery (the "bloody flux" or *bloedloop*), scurvy and venereal diseases such as gonorrhoea and syphilis.

These diseases were not unknown in Europe, but European constitutions seemed to have a reduced resistance to them in hot climates. Malaria, described by contemporaries as an unspecific *landziekte* (land disease), or as a *moeraskoorts* or *rotkoorts* (morass or rotting fever), was known in Europe but was more widespread in the tropics. Moreover, diseases that had been prevalent among the inhabitants of one part of the world began to plague the inhabitants of other parts and an epidemiological transition took place. For instance, yellow fever (*zwarte loop* or *chocoladeloop*) became rampant on Caribbean islands and even threatened the success of European military operations in the region, while skin diseases such as leprosy, eradicated in most of Europe, were encountered again in South America (Crosby, 1972, pp. 4–31; Kiple, 1984; Sheridan, 1985; Arnold, 1996; McNeill, 2010; Snelders, 2012, 2017).

In this chapter, I will show how physicians, surgeons and educated laymen in the Dutch Atlantic understood and attempted to manage these health problems on the basis of a framework provided by the Hippocratic tradition, in which the understanding of the role of the climate and its effects on the constitution was considered key. The discourse that the conditions in one's birthplace determined constitutions, and that managing health and disease needed to be adapted to one's specific constitution was quite general in European colonial medicine. It implied that bodies had to acclimatise when entering new climatological conditions in the tropics, and put emphasis on the necessity of modifying therapeutics to the climate (Harrison, 1996, 2010; Wear, 2008; Smith, 2015). Although the Dutch colonies in the Atlantic were not settlement colonies for people from the homeland and African slaves were forcibly used to labour the plantations, similar discourses around the role of the climate as in other Western and Northern European colonies shaped the health practices of colonial medicine in the Dutch Atlantic. This shows how the influence of the Hippocratic tradition in the tropical colonies was not restricted to individual nations but was rather supranational.

The pre-modern medical understanding of constitution and climate might have lacked the insights of modern bacteriology and tropical medicine, but it was not a purely theoretical exercise. Rather, it offered a flexible and pragmatic way of dealing with concrete health problems in the tropics. By the later eighteenth century, it had led to definitive though perhaps not ideal improvements in managing the climate's effects on health and disease. Until well into the nineteenth century, the influence of this framework remained essential in maritime and colonial health care in the tropics, even where explicitly classical formulations of the role of the six non-naturals (including climate or air) fell out of fashion.

In the circulation of knowledge and practices needed for the prevention and treatment of disease in the tropics, the practical experiences and expertise of doctors, surgeons and laymen travelling and working in the hot climates were of crucial importance. They needed to improvise answers to the challenges of a disease environment with unique properties, and one for which the academic

knowledge originating in Western European metropoles was often useless (see Ferreira Furtado, 2008, on Portuguese "tropical empiricism"; Harrison, 2010, on medicine in British tropical colonies). Since academically trained doctors were rare across the Atlantic anyway, craftsmen such as surgeons were pivotal in developing the knowledge of how to modify therapeutics to the climate. They developed knowledge in local contexts that became embedded in global networks of local exchange (Chakrabarti, 2010). It has been suggested that by the eighteenth century, Dutch academic medicine itself focused on clinical detail and "refused to speculate" (Cook, 2007, pp. 383–396). Nevertheless, as I will show below, Dutch surgeons with experience overseas could view their approach as a conscious rebellion against the bookish knowledge of academic doctors.

Though the medical profession in the Dutch Atlantic had its fair share of incompetents and drunks, the best of them tried to formulate answers to concrete problems of prevention and treatment in an empirical way, and were prepared and curious to learn about these answers from long-time inhabitants in the tropics among which were African slaves and native Indians (see Achim, 2011; Gómez, 2017, on the importance of non-European knowledge and practices). This empirical knowledge was collected and put to use within the context of the Hippocratic tradition of ideas about the relationship between climate and constitution. Although it has been claimed that medicine of the Dutch Golden Age was especially interested in "facts" (Cook, 2007), what was accepted as "fact" rather than as quackery, deceit or even diabolical interventions were those therapeutics that could fit into the existing *Denkstil* of the observers. Shamanic therapeutics like healing by "sucking objects" out of the body were observed and reported, but not experimented with (Snelders, 2012, p. 85).

To better understand this practical process of collecting and disseminating knowledge on how to stay healthy in the hot climates, I will first discuss the health problems encountered in those regions, and then the understanding of these problems from the perspective of classical ideas on climate and constitution. Then I will enter more deeply into one particular case to show how the process of adapting to the hot climate worked in relation to the eighteenth-century surgeon Abraham Titsingh. Finally, I will offer a few examples of how life in the Dutch Atlantic adapted, at least to some extent, to the hot climate.

Confronting the hot climate

Accounts of European colonial expansion in the tropics can and have been interpreted from many different perspectives. They can surely be read as the story of one continuous confrontation with disease. A typical experience was that of John Gabriel Stedman (1744–1797), a Scottish-Dutch mercenary soldier who served as an officer in the army of the Society of Suriname from 1773 to 1777.[1] Stedman and his fellow soldiers first had to endure the tropical heat onboard

their ships when crossing the Atlantic. On reaching a tropical country and being allowed to move freely, at first they were ecstatic. As Stedman remembered,

> I must indeed acknowledge that nothing could equal the delicious sensations with which we seemed intoxicated by the fragrance of the lemons, limes, oranges and flowers, wafted over from the adjoining plantations that line the banks of all the rivers in this ever-blooming settlement.

However, on the same page of his reminiscences of his Suriname adventure he went on to write "But how miserably [the] poor fellows [of the ships crews] were mistaken in their reckoning shall soon be seen" (Stedman, 1972, p. 12). The newly arrived Europeans almost immediately encountered trouble in paradise:

> on the second morning after our landing … my face, my breast, and hands, were entirely spotted over like the skin of a leopard, occasioned by myriads of *gnats* or *mosquitoes*. … These insects are inconceivably numerous here during the rainy season, and particularly on the banks of creeks and rivers. None are secured from their attacks, but they peculiarly infest strangers in preference to the natives; and wherever they insert their proboscis, and remain unmolested, they suck the blood till they are scarcely able to fly.
>
> (Stedman, 1972, pp. 16–17)

These insect attacks were only the beginning of a continuous weakening of the health of the soldiers. After one month in Suriname, Stedman contracted scarlet fever, as did almost all newcomers to the colony. In the colonial capital Paramaribo, the health of the soldiers was further undermined by forced idleness, depression and excesses due to the generous availability of drink and enslaved women. Stedman's debauchery resulted in a high fever that confined him to his hammock for five days. However, this was still only the beginning of his tribulations. After five months in Paramaribo, the troops were sent into the jungle to fight the rebellious Maroons who had escaped from slavery. By then already a quarter of the more than 500 soldiers were, according to Stedman, either dead or invalidated. In the jungle, the soldiers were afflicted with ulcers and dysentery. They underwent what Stedman called

> the severest misery that was ever inflicted on sublunary beings … prickly heat, ring-worm, dry gripes, putrid fevers, biles, consaca [a fungal infection of the feet], and bloody flux [dysentery], to which human nature is exposed in this climate … and many other calamities [such as] lethargies, dropsies, &c. &c.
>
> (1972, pp. 153–154)

According to Stedman's perhaps slightly exaggerated account, of the 1,200 soldiers that had left the Dutch republic together with him in 1772, only 100 returned 5 years later, and of those only 20 were still completely healthy (1972).

Table 3.1 Mortality figures in Elmina 1719–1760. Based on Feinberg (1974)

Duration	*Figures (%)*
1719–1729	242 (24.2%)
1730–1739	209 (21.0%)
1740–1749	128 (13.0%)
1750–1760	188 (19.0%)

To these accounts of Stedman, many testimonies and reports recounting similar experiences, from personnel of the WIC, the Dutch navy, the Society of Suriname and other institutions can be added. The first such testimonies concerned Guinea in West Africa, where from 1594 onwards the Dutch tried to break the Portuguese control of the gold, pepper and ivory trades. The country was described as

> for us extremely hot … and especially the rain, that causes great filth and worms because she is moist and warm is harmful, is a mother of putrefaction. Because of this many diseases occur, especially hot fevers, diarrhoea and dysentery and such.
>
> (Van Linschoten, 1596)

West Africa would later become known as the "White Man's Grave" (Curtin, 1961). This was not without justification: mortality figures in the WIC fortress in Elmina between 1719 and 1760 were five to ten times higher than in Europe (Table 3.1).

When the Swiss surgeon Samuel Brun arrived in Fort Nassau, a Dutch trading settlement on the Gold Coast near Moree, he found a garrison in which nearly everyone was plagued by worms and diarrhoea. Brun thought himself lucky to get back alive to the Republic after three years of service (Jones, 1983, pp. 78–93). Two hundred years later, a civil servant in Elmina would still write that "only few have such a fortunate disposition that the effects of the climate do not harm them any more." But even they had to pay the toll of an unspecific "land disease" (*landziekte*) on their first arrival (De Marrée, 1817, p. 12). In 1768, Scottish physician James Lind wrote that:

> Men who thus exchange their native for a distant climate, may be considered as affected in a manner somewhat analogous to that of plants, removed into a foreign soil; where the utmost care and attention are required, to keep them in health, and inure them to their new situation; since, thus transplanted, some change and alteration must happen in the continuation of both. Some climates are healthy and salutary to European constitutions; as some soils are favourable to the production of European plants. But the

> countries beyond the limits of Europe which are chiefly frequented by Europeans, are very unhealthy, and the climate often proves fatal to them. (Lind, 1768, pp. 2–3)

This very Hippocratic idea that Europeans had to take special care when "transplanted" (as Lind described it) to the hot climates had by then become a staple of eighteenth-century medical literature. But it had already been commonplace in the writings of Dutch doctors, surgeons and travellers since the start of the Dutch maritime and commercial expansion to the tropics in the 1590s. For instance, the necessity of adapting to the hot climate was elaborated in the famous *Historia naturalis Brasiliae* of Willem Piso and Georg Marcgraf published in 1648, detailing the conditions in Brazil, and advising on regimes of prevention and treatment using information obtained from both Portuguese and Native American inhabitants of the region (on Piso and Marcgraf, see Van den Boogaart, 1979; Pies, 1981; Brienen, 2001; Cook, 2007). The book starts with an exposition of the climate in the classical terms of air, water and places, showing the continuance of the Hippocratic tradition (Piso and Marcgraf, 1648, pp. 1–14). In West Africa, German soldiers and surgeons in the service of the Dutch unfavourably compared the resistance of the northern Europeans to the effects of the climate to those of the Portuguese, who they thought were more acclimatised (Ribeiro da Silva, 2011, p. 112) (Figure 3.1).

Hot airs and constitution

Works on medicine in the tropics from Piso to Lind and beyond show the continuing influence of Hippocratic ideas on the role of the six non-naturals in medical thought up until the late eighteenth century. In the understanding as well as the treatment of diseases of Europeans in the hot climates, the interplay between constitution and climate was the key. Not only was there no reasonable rival framework available for managing these diseases, working from this framework also offered methods to improve the health of Europeans in the tropics by manipulating the relevant factors. The air in which people lived, one of the six classical non-naturals, was considered of primary importance in causing disease in the hot climates. For instance, the heat of the air, to which northern Europeans were unaccustomed, played a decisive role in causing what were called "hot fevers." In our current medical understanding these hot fevers would be seen as a symptom pointing to many possible diseases. In classical and early modern medical thought, however, hot fevers were considered a disease in their own right when unaccompanied by other observable external ailments (Hamlin, 2014, pp. 23–87). This understanding was widely disseminated among both doctors and surgeons and educated layman. The popular Dutch *Book of Medicine*, an adaptation by the Dordrecht city physician Carel Baten (Battus) of a German textbook and published in seven revised editions between the 1580s and 1630s, discussed hot fevers from this classical perspective. According to Battus, hot fevers occurred when the healthy circulation

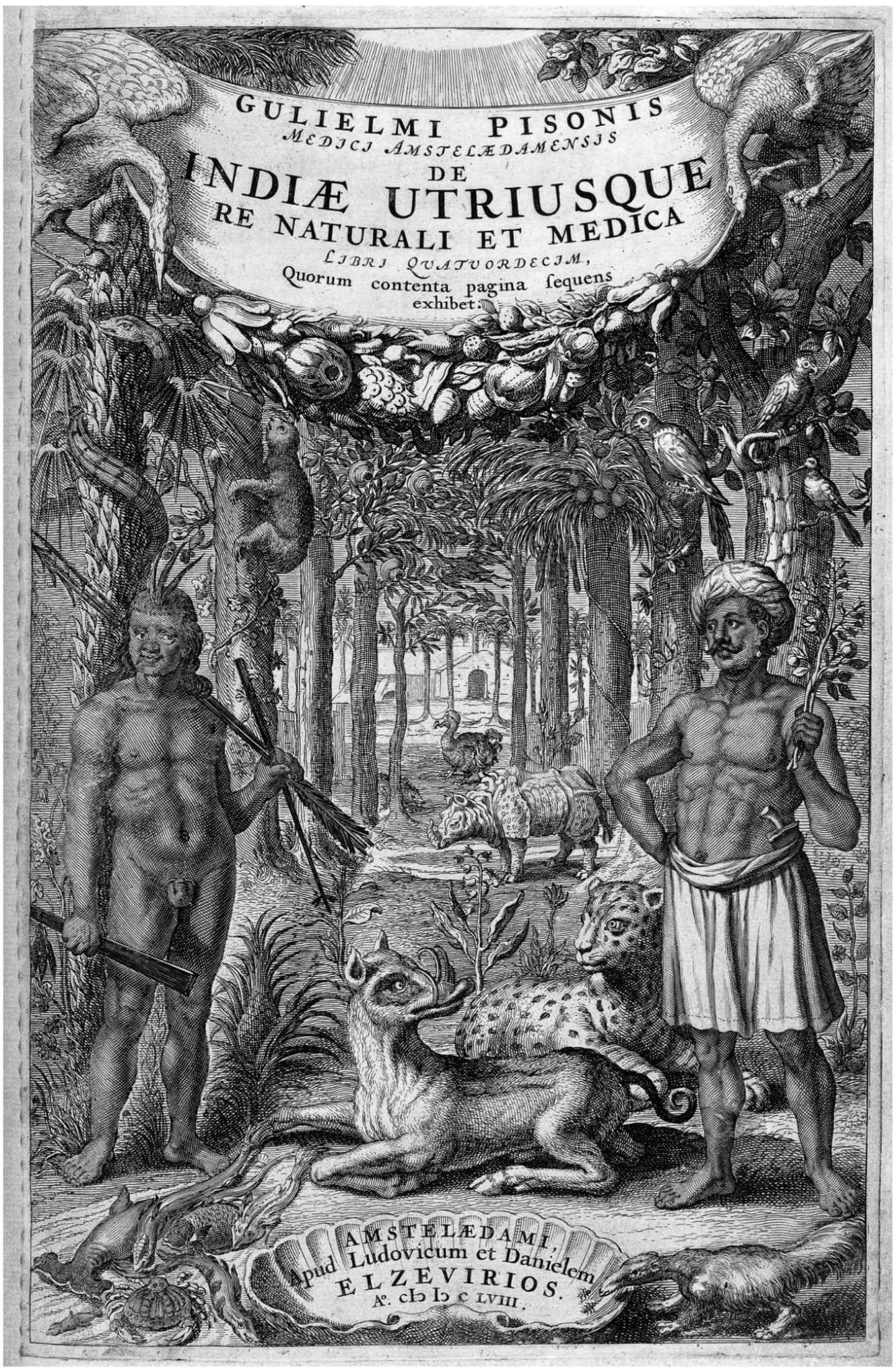


Figure 3.1 Frontispiece of Willem Piso on the natural history of the Indies. Courtesy of the Wellcome Collection.

of the humours in the body was obstructed. This could have many different causes, such as individual predisposition or an unhealthy lifestyle. The hot air in the tropics was another possible cause, and therefore a major reason why the hot climates were unhealthy for Europeans. The hot air dried up the veins, especially when performing heavy physical labour in the burning sun. When there was no fresh air, or when it became chillier at night, sweating and the natural transpiration of the body was obstructed. Humours then became tough and started to rot, causing a heat in the body that moved to the heart and from there affected the whole body in a hot fever, with possible fatal consequences (Wirsung, 1627, pp. 535–562). This understanding also offered a solution:

re-equilibration of the body, for instance by purging the humours. Even when after around 1660 rival theories about and explanations of fevers arose, such as the iatrochemist and iatromechanist interpretations, this basic strategy did not radically change (Hamlin, 2014, p. 68).

This understanding of hot fevers framed both medical and lay thought on the health problems encountered in the tropics. An Amsterdam merchant wrote in 1598 from the island of Sao Tomé in the Gulf of Guinea, before the coast of Gabon in West Africa, to his business associate in Leiden complaining about the "evil, unhealthy air" on the island (Unger, 1940, p. 203). Sao Tomé was a Portuguese colony and an important producer of sugar as well as a transit centre for the slave trade. But since the island was mountainous, the air was not only hot but also lingered without fresh air coming in from the ocean. Half a century later, a young Dutch merchant serving the WIC on arrival at Sao Tomé preferred to stay on board his ship rather than to disembark on the island. According to him the humid morning vapours on the island were so poisonous that no European could bear them. They caused malignant fevers with alternating cold shivers and excessive heat in the limbs, headaches and abdominal cramps, leading to possible death in a few days. "The air here is as hot and unhealthy as anywhere in the world. Most of us who come there and stay at land die there because of the unusualness of the air," he claimed (Nieuhof, 1682, pp. 7–8).

Air that was not only hot but also stagnant and lingering was often perceived as a major health problem on the coastline of West Africa. In Elmina, "the white man's grave," there was much complaint about the quality of the air. The castle was built on rocks at a river bend close to the ocean. Before the castle gate, above the river bend and upwind of the castle itself, was an African town which in the eighteenth century had between 12,000 and 16,000 inhabitants. The Dutch described the town as full of dirt and squalor. The air from the town reached the castle through a small street and mingled with the air from the basement of the castle where the enslaved and prisoners were held. The bad airs lingered in the inner courtyard of the castle. Moreover, according to WIC Chief Merchant Willem Bosman, the stinking airs of the town (caused by rotting fish and excrement dumped throughout the village) mingled with the thick and sulphurous vapours and mist of the African winter that lingered especially where there was water. These airs could not escape because of the high mountains in the area. The Dutch could not bear the malodourous airs: newcomers did not because they were not used to them, and those who had stayed longer did not because their health was already undermined (Bosman, 1704, pp. 102–104; De Marrée, 1817, pp. 1.130, 2.5–10).

It was not only the direct influence of the hot airs and their lingering that affected European constitutions so badly. The hot air also had indirect consequences. Food was often of low quality and rotted quickly in the climate, leading to deteriorated constitutions, dysentery and scurvy. Especially the lower-ranking servants and soldiers had an inadequate diet and an unhealthy lifestyle. Their food consisted of bread, oil, salt and a little fish, with a good

deal of brandy and palm wine on the side (Bosman, 1704, pp. 102–104). The daily register of Elmina mentioned in 1647 that,

> it is sad to observe the soldiers so naked and bare. … [S]ince the moment they receive their monthly payment … they drown it in palm wine. They walk around with a naked upper torso, sleep in open bags, some on mats and others not, which causes a high mortality.
>
> (Ratelband, 1953, p. 174)

Their health was further undermined because their "offers to Bacchus" were combined with "offers to Venus": habitual visits to African prostitutes (Bosman, 1704, pp. 102–104). Venereal diseases were rife in the eyes of contemporaries because the hot climate also led to a "hot nature" of African women, which was contrary to the nature of Europeans (De Jonghe, 1606, p. 35).

The West African climate was therefore considered especially dangerous to Europeans. In comparison, other parts of the tropics could be seen as more healthy, though even here lifestyle of Europeans had to adjust to the climate. Brazil, for instance, was compared very favourably with West Africa. The Dutch adventurer and poet Elias Herckmans wrote in 1639 of the province of Paraiba in Northeast Brazil that the heat there was moderate and the air not poisoned by vapours from the swamps and lingering bad odours (1879). The essential difference here with other tropical areas was the supply of fresh sea wind. The Dutch physician in Brazil Willem Piso thought that the Brazilian climate was not so bad on the coast. Inland, however, in the direction of Peru, there were many swamps that released bad vapours, as in West Africa. Moreover, nights here were especially chilly and full of dew. On the coast, the daytime heat still caused hot fevers, but because of the fresh winds fewer infectious and malignant diseases were transmitted through bad and lingering airs. Nevertheless, Piso maintained that a healthy lifestyle was essential to adapt the European constitution even to the relatively healthy airs of Brazil. Europeans who "sacrificed themselves to the god of Wine" were at risk of certain fevers, in particular quartan fevers that return at three-day intervals. Piso observed how newcomers not used to the extreme temperature shifts between day and night were afflicted with colds and infections. Youngsters arriving in the colony insufficiently rested after the ocean journey, eating too much fruit, drinking too much cold water, and bingeing on wine and brandy ended up with colds and stomach problems (Piso and Marcgraf, 1648). The European remained a plant transplanted to an unsuitable climate, even where there were fresh winds.

How to gain the knowledge to adapt to the hot climate

The application of Hippocratic ideas on the role of the air and its influence on the constitution to the experiences in the hot climates of West Africa and South America was far from being a theoretical exercise. Early modern medical

thought and practice in the tropics should be seen as a kind of common sense medicine, centred not on pathogens and specific diseases but on disturbance of balance and with a strong holistic emphasis, considering the individual in an environmental context. When an individual was affected by seeds of disease, for instance the leprosy virus, this did not necessarily develop into the disease unless the constitution was affected and out of balance (Snelders, 2017). The development of thought on health care in the tropics was thus situated within the context of the six non-naturals, a model that proved to be a flexible and useful tool in the construction and application of medical knowledge. Of essential importance was the realisation that health problems were specific to certain regions. This meant that specific methods of prevention and treatment of these problems could be found in these regions as well, since as the seventeenth-century Dutch physician Johan van Beverwijck explained: "God does not strike without that He heals again and he gives each one cold according to his clothes" (1992, p. 47). In accordance with this, Dutch naval and colonial medicine in the tropics was primarily concerned with adapting its practices to the changed climatological conditions.

To succeed in this adaptation to tropical conditions, the basic concept of the non-naturals proved a useful tool, but to use this tool properly the Dutch needed knowledge that could only be found in the tropics themselves. Finding this knowledge was, however, not an automatic process, nor a purely logical consequence of a certain way of medical thinking. It needed a special kind of researcher, what I have elsewhere called the adventurer-scientist with a freebooter spirit (Snelders, 2009, p. 2012). Here an important distinction existed between what we may call academic research and research "in the field." Stafleu investigated the differences that existed in the eighteenth century between the armchair botanists at European universities such as Linnaeus and Boerhaave and the botanist-travellers that were sent into the field to discover new plants and their medical properties (1971). The latter belonged to a broader category that already existed in the seventeenth century and included more than explorers with some form of academic training (Cook, 2007, p. 2). These adventurers were a very diverse group, ranging from medical doctors like Piso to merchant-adventurers like Herckmans. However, they shared some common characteristics. They had a capacity for accurate and detailed empirical observation and for expressing these observations. They were also part of a network for the dissemination of information, connecting their work to, for instance, the boards of trade companies and academic botanists. Their activities had important practical and pragmatic components stimulating trade, expansion, possibly even privateering and piracy. An adventurer-scientist was to some extent able to open-mindedly create and sustain contacts with indigenous and to him strange cultures. They searched for specific knowledge, medical and otherwise, using various methods, such as spying on their earlier Portuguese and Spanish competitors; exchanging medical knowledge with African doctors and indigenous Brazilian and Caribbean people (for example, by sending expeditions into the interior of Brazil); and attempting to obtain herbal knowledge

from the enslaved. For example, much of the information in the work of Piso was taken from the reports of adventurers venturing inland and encountering practices of native Indians. Most importantly, these adventurers had the capacity to operate in the stressful and often violent conditions of travel, sea voyages and war, and this more than anything set them apart from the academic researchers who stayed at home. Moreover, the adventurers' work was pragmatic and driven by the needs of the colonial project as well as of their own material advancement (Snelders, 2009, 2012).

The case of Abraham Titsingh

The adventurers' knowledge slowly seeped into textbooks and practices onboard ships and in colonies in the Dutch Atlantic. In the course of the eighteenth century, we can notice signs of adaptation to the tropical climate on something like a structural scale. Here I will take the work of Amsterdam surgeon Abraham Titsingh (1684–1776) and the dissemination of his observations in maritime and naval textbooks and practice as an example of this process. The case of Titsingh shows not only how the influence of the classical ideas around climate and constitution continued to be key in eighteenth-century thought and practice, interacting with the experiences of the Dutch in the tropics. The case also demonstrates that this was a practice – rather than theory-driven process. It was also fraught with resentment about what Titsingh considered the pretentions of academic physicians (Figure 3.2).

Important texts that inform us about ideas and practices of Titsingh and other Dutch ships' surgeons in the eighteenth century were published in Amsterdam in the 1740s and 1750s, in particular de *Kunst-broederlyke lessen of noodige aanmerkingen, wegens de Koortszen op Schepen van Oorlog* ("Teachings of a brother of the art … concerning Fevers on Warships") in 1742, and the *Geneeskonst der heelmeesters in dienst der zeevaart* ("Ships' surgeons medicine") in 1752. At first sight these books seem to lack all coherence and system. They are rambling, chaotic works that lack the structure of earlier textbooks published in the Dutch language. For instance, the *Surgeon's Sea Compass* of Cornelis vande Voorde, published in 1679, is structured around different diseases that the surgeon would possibly have to manage. Titsingh's books appear to be a faithful resemblance of the character of their author, since his life was also often as rambling. He was a proud man, a quarrelsome fellow quick on the lookout for trouble. He made many enemies, not in the least among his professional colleagues in the surgeons' guild of the city of Amsterdam. Historians have therefore tended to dismiss him as an erratic and idiosyncratic character (Banga, 1868, pp. 2.781–792; Krul, 1891; Geijl, 1912; Pop, 1922, pp. 30–31; Leuftink, 2008).

Though this is certainly justified to some extent, there is more to Titsingh than this. Here I argue that the biography, self-understanding and lack of coherence in his writings help us to understand how experiences were collected in the tropics and how they made their way into textbooks and health care.



Figure 3.2 Abraham Titsingh (1742). Courtesy of the Wellcome Collection.

Although rather an unstructured rambling, his writings fit into a genre of observational practices that arose in European medicine as early as the second half of the sixteenth century and the first half of the seventeenth century. Gianna Pomata has argued that this genre arose among practitioners rather than university physicians. She writes: "The main impulse to the publication of *observations* came from a more assertive attitude of self-promotion by [those] who stressed success in practice, over and above academic learning" (Pomata, 2005, 2011, p. 59). This is a perfect description of Titsingh's impulse in writing his books. A closer reading of them reveals that they relate all kinds of experiences and evaluations of the medical practice of ships' surgeons, not only of Titsingh himself but also accounts of his colleagues, with some contempt expressed for academic physicians. The sprawling nature of his writings turns out to be not only a reflection of the inadequacies of Titsingh as a systematic author, but they look almost intentional, a declaration of independence from the system-building of

university professors and a demand for a practice-oriented, close observation of medical cases (Titsingh, 1742, 1752). One of the important tenets of the writer turns out to be: "Not *theoria*, but *practica* keeps the sick patients alive" (Titsingh, 1752, p. 14).

Titsingh wrote of himself

> that he presumed too many liberties and had his own tricks. [But] one should consider, when he spoke a little too freely, that he was a freeborn Dutchman, an *Amsterdammer*, who spoke the truth without restraint for the honour of his fellow countryman, his contemporaries and his colleagues … to show that there were men in Amsterdam and that it was unnecessary to send pupils to Paris to learn surgery.
>
> (Banga, 1868, p. 2.792)

He praised the virtues of the ships' surgeons, the social group to which he belonged both by profession and training as by birth: his father had been a naval surgeon himself and was killed in a battle with the French when Titsingh was seven (Banga, 1868, p. 2.781). Abraham continuously praised the ships' surgeons in his writing, calling them "true Asclepiads" (after the famous doctors of Antiquity). They needed knowledge, not only of surgery but also of physics, chemistry, botany, astronomy, physiology, pathology, therapeutics, pharmacy, hygiene, the health of their crews and the history of naval diseases. They learnt their trade in practice and not from theory. "Experience at the sick bed was the main thing," according to Titsingh, and he had a dim view even of famous academics such as Boerhaave and Sylvius, whom he described as blinded by their school knowledge and misleading the young by their unproved sentiments (Banga, 1868, p. 2.792; Pop, 1922, p. 30). Titsingh was not the only surgeon irritated by Boerhaave's "armchair medicine," although at the same time he was on speaking terms and in correspondence with Boerhaave himself (Krul, 1891, p. 446). But the surgeon's dislike of physicians was also fuelled by economic motives. In 1746, the influential doctor Willem Röell led on behalf of the Collegium Medicum, the medical supervisory board of Amsterdam, a campaign to exclude the surgeons from the practice of obstetrics. Röell was himself town obstetrician and lecturer to the city's midwives. Titsingh took the lead in a three-year fight against this campaign, leading to a compromise in which surgeons could, after examination (by physicians), receive qualification to practice obstetrics (Krul, 1891, pp. 439–44).

Both from a practice-oriented and anti-authoritarian stance, Titsingh disliked established medical science and this stimulated him to have an open ear to the inhabitants of the tropics, and to develop and implement naval expertise aimed at survival in unhealthy hot climates. Titsingh liked to think himself as an outsider, and his reworking of ideas on climate and constitution in the hot climates were presented from this outsider perspective, as a product of the everyday experiences of naval surgeons and sailors. At the same time, however, he worked from the same traditions of classical thought on climate and

constitution as his predecessors in the Dutch Atlantic, a framework that made sense of his experiences and the advice of inhabitants of the hot climates.

After the death of his father, Titsingh went into apprenticeship with one of the latter's friends, a Swedish surgeon. At the age of 16, he went to sea and for the next decade he travelled on various voyages, becoming a qualified ship's surgeon when he was 18 and visiting the West Indies on a number of occasions. In 1710, he left the seas and passed the examination for master surgeon in Amsterdam and started a successful career there, becoming surgeon of the Admiralty of Amsterdam (one of the five admiralties of the Dutch Republic responsible for the Dutch navy) and one of the directors or *overmannen* of the surgeons' guild. Before leaving the sea, Titsingh sailed in 1706 as a naval surgeon to the West Indies. His ship anchored in the harbour of the island of Curacao, close to the coast of what is now Venezuela. This small island, occupied by the Dutch in 1634, was a crucial station in Dutch trade and privateering in the Caribbean, and especially of importance as a transit point in the slave trade from West Africa. Like other Caribbean islands, Curacao had a reputation for unhealthiness. This was considered to be partly the result of the conditions of the hot climate, and partly the result of the failure of white Europeans to adapt themselves to these conditions. A description dating from later in the century described a familiar dynamic: how when the Europeans came on land they feasted excessively, drank and ate too much and "followed other lusts," resulting in fevers and the "bloody flux," dysentery (Hering, 1779, pp. 35–37).

To Titsingh, however, Curacao did not seem that unhealthy at all. According to him, fevers and other diseases that occurred on the island were often the consequence of faulty diagnoses by doctors and surgeons. Titsingh's approach to Curacao was similar to that taken by Piso and Marcgraf to Brazil: one should find elements for a healthy lifestyle in the uncongenial hot climate, and to do so one should consult experts, i.e. long-term inhabitants of the island (Titsingh, 1742, p. 67).

Half a century later, Titsingh described his experiences and gave advice to his fellow medical practitioners. His main source of information on Curacao was not a book by Hippocrates, but the stories of an "old Nordic woman" named Mother Catyn who had lived for a long time on the island. Mother Catyn taught Titsingh how to preserve his health. To start with he should refrain from visits to the African prostitutes near Fort Amsterdam, the Dutch fortress. These prostitutes were infected with "hot fevers" and with the "choc-olate flux," the "black Vomit" (yellow fever). Excesses with wine or women were strictly proscribed. Titsingh should not consume too much fruit, because of the danger of flux or diarrhoea. A few cooked fruits with meat and fish, prepared with Spanish pepper and with lots of bread, constituted an adequate midday dinner. Madeira, a wine that remained good in the climate, should be the drink of choice with rum-punch being the only allowable alternative. Small sips of freshwater should be taken continuously during the day. When sleeping, Titsingh should take care not to get cold: he should sleep in a closed-off

chamber, naked in a hammock but with a cushion on his chest and under his head.

Not only did Titsingh follow this advice himself, he also introduced a similar regime on his ship, a warship with a crew of 300. He claimed that on this voyage of 13 months only 3 men died, of which 2 expired in the 4 months that the ship was at anchor in Curacao harbour. He generously gave part of the credit for this result to the captain, who had heeded the advice of another captain and taken care not to lay at anchor in the so-called *waaigat* ("whiffle hole") of the harbour, where there was too much hot wind during the day (so that the sailors were too languid to take exercise) and too much cold wind in the night (so that the sailors caught colds). In his later books, Titsingh would emphasise the need for proper hygiene on the ships, fresh water, fresh lemon juice and Madeira, fresh air, no spoiled meats and exercise. As had been the case in West Africa, fresh air was considered of primary importance in the tropical heat. According to Titsingh, lack of fresh air and sailors sleeping close to each other in moist and damp air, combined with the extreme heat, led to putrefaction and corruption of bodies, aggravated by a diet of rotten victuals and bad and stinking drinking water. Fevers, dysentery and the new disease called "chocolate disease" (yellow fever) were the consequences (Titsingh, 1742, pp. 67–81). But in contrast, "when Europeans avoid excesses and make properly use of the *res non-naturalia* they too could remain healthy [in the tropics]" (Titsingh, 1752, pp. 314–315). Although Titsingh's approach emphasised practice above theory, it was deeply influenced by the classical ideas on the non-naturals and the role of the air.

How typical was Titsingh for his fellow naval surgeons? His quarrelsome nature and open contempt for academic physicians set him apart from his colleagues. The chaos of his writing style is extreme compared with that of other medical writers (Leuftink, 2008, p. 39). However, Titsingh's approach to and views on medicine in the tropics were fairly representative of what we encounter in the practices of Dutch naval medicine as well as in Dutch naval medical textbooks. He incorporated observations of other surgeons in his own books; for instance, the observations of naval surgeon Anton Schlapprizi concerning yellow fever on a voyage to Curacao in 1740–171 were published in Titsingh's *Konst-broederlyke lessen* (1742, pp. 82–96). Titsingh's recommendations for staying healthy in the tropics were very similar to those in the 1765 treatise on maritime medicine by ship's surgeon and later medical doctor Lodewijk Rouppe (1729–1780). Rouppe, mentioning his own experiences as a surgeon of a navy ship voyaging to Curacao in 1760, found it remarkable how healthy the ship's company stayed when adequate measures were taken to accommodate the transition to the hot air, including good ventilation and allowing enough space between the crew's berths so that the air would not linger (1765, pp. 209–247). The necessity of fresh air was also included in seventeenth- and eighteenth-century recommendations on slave ships, although whether these recommendations would always have been followed up in practice is, of course, another matter (Snelders, 2012, pp. 116–122).

Adapting to the hot climate: transformations in Dutch Guyana

Not only on naval and merchant ships were the experiences in the hot climates and the influence of ideas on the non-naturals translated in regimes for dealing with the hot air. A similar development took place in urban settlements in the Dutch Atlantic such as Suriname. Let us compare the reports on the Dutch colonies in Guyana (Suriname, Essequibo, Bernice, Demerara) at the end of the seventeenth century with those a century later. The colony on the Suriname River in Guyana on the north coast of South America went over from the English to the Dutch in 1667. It was said that the country was plagued by an "avenging angel" who struck almost every house with fevers and death. This metaphor was especially directed at the supposedly nefarious effects of the stinking vapours emerging from the swamps in the colony – although the Governor praised the fresh winds coming in from the sea chasing these vapours away, perhaps for public relations objectives (Cohen, 1991, p. 34). The neighbouring colony at the Essequibo River, obtained by the Dutch West India Company in 1674, also showed all characteristics of an unhealthy hot climate, including the sudden drop in temperature at night and the stinking vapours that could linger in the evening. Colonists in the marshy forests got drunk each evening on Dutch gin (*jenever*) in order to be able to ignore the evil smell and the stings of the mosquitos living near the water (Rodschied, 1796, pp. 11, 108). The heat in the Dutch colonies in Guyana also led to other aspects of an unhealthy lifestyle, such as lack of exercise (Van Berkel, 1695). Just as on the Gold Coast of West Africa and in Dutch Brazil, it was the poor colonists in particular who had to suffer most in the hot climate. A doctor working in Suriname in the 1750s reported a high level of mortality, especially among the poor on the ships that arrived in the colony. Not only did they already suffer from bad air on the ships, on land they had also to survive in the extreme heat on the plantations. "So nobody needs to be surprised when I say that I, in the year 1756, have seen buried up to eight of these unhappy people on a day of extreme heat, without counting the dead bodies of inhabitants of the town" (Fermin, 1770, pp. 36–37).

As we have already seen from the reports of John Gabriel Stedman, survival in and acclimatisation to the tropical climate was still problematic for newcomers from Europe. Nevertheless, managing the effects of the climate did change as we can read for instance in the medical topography of Essequibo written by the German doctor Ernst Karl Rodschied (?–c. 1802). He arrived in the colony in 1790 after receiving his degree at Marburg University. Rodschied described how the colonists adapted their lifestyle to the hot climates, if they had the means to do so. They had learned that they should live in houses with high ceilings and many windows to maximise the circulation of the air. If possible, the houses were built of stone to stay cool, with a wooden floor to prevent cold feet and possible rheumatism. In daytime, the colonists would wear linen clothing, and when the evening fell, they would put on cotton coats that could be buttoned

up tightly in order to avoid the evening chill. According to Rodschied, if one adjusted one's lifestyle and also took care not to indulge in alcohol and to have a varied diet including plenty of vegetables, Essequibo was the healthiest country in the world and people lived there to the age of 60 or 70. Demerara was perhaps a little unhealthier because the major settlement was close to a marshy forest, but near Paramaribo, the major settlement in Suriname, most of the unhealthy marshes had been drained by 1800 (Rodschied, 1796; Ludwig, 1789).

So some important improvements had come out from the experiences of the Dutch in the hot climates and their observations on how to deal with the

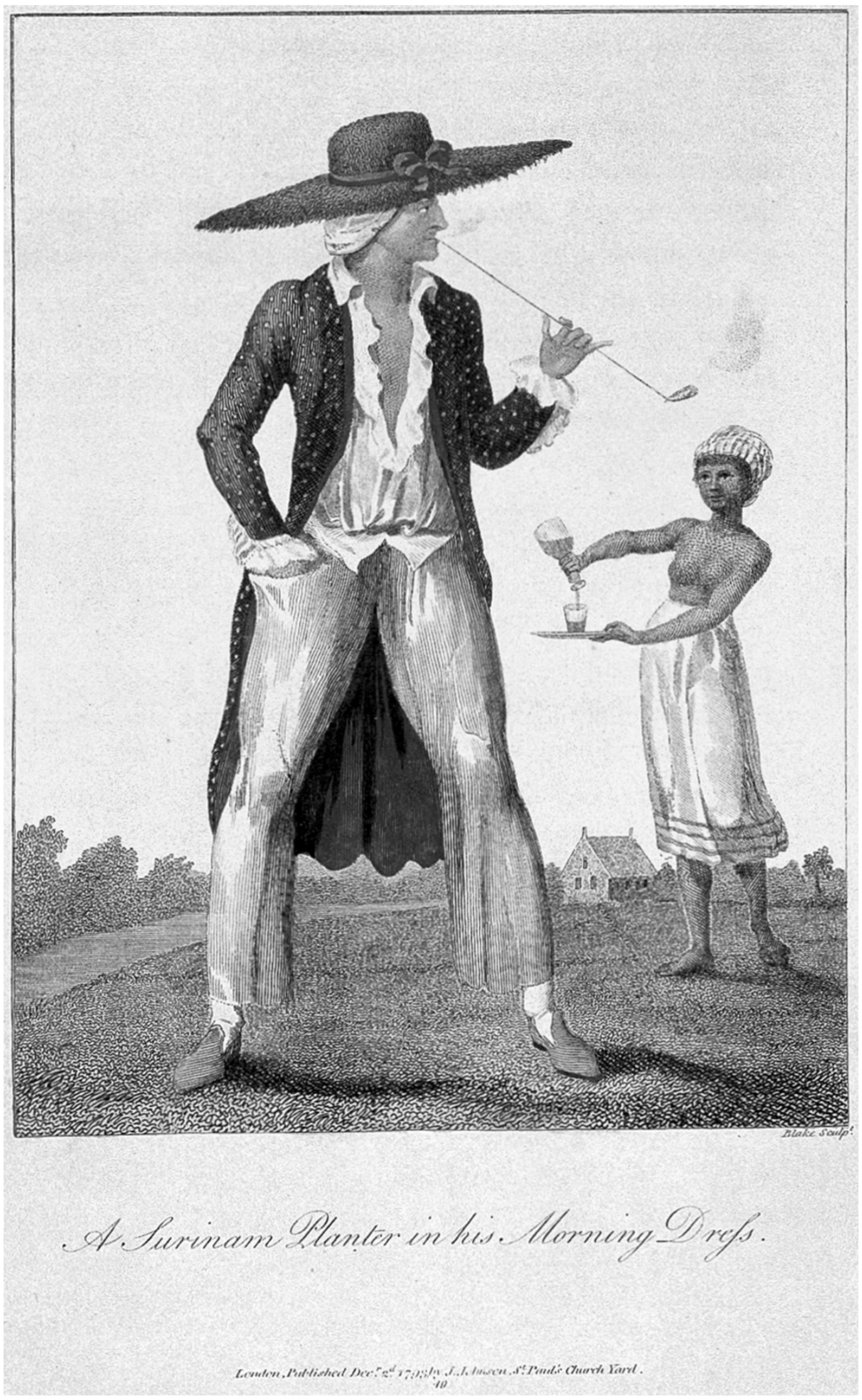


Figure 3.3 A Surinam planter in his morning dress, in J. Stedman, *Narrative of a Five Year's Expedition*, 1796. Courtesy of the Wellcome Collection.

hot climate. Most of these improvements would primarily have benefited the wealthier colonists. Soldiers sent out to the colonies were, despite recommendations to the West India Company by the Governor of Essequibo in 1750, still outfitted in wool uniforms rather than in linen (Harris and Villiers, 1911, p. 275). The overwhelming majority of inhabitants of the colonies, African slaves and their descendants, were dependent on their masters to a significant extent on whether to adopt a healthy lifestyle. But even among these poorer whites and among Africans, not all agency was lost in adapting a healthier lifestyle in accordance with the climate. John Gabriel Stedman learnt from an "old Negroe" named Caramaca how to survive in the heat of the jungle. Caramaca taught him how to stay cool by wearing light and ventilating clothing. Stedman's soldiers had already adapted their heavy blue and red uniforms when going into the jungle, when they would wear trousers, a cotton shirt and a short linen coat. On the advice of Caramaca, Stedman went even further by adopting a kind of buccaneer outfit consisting of only a linen shirt and trousers, and walking bare feet. According to Stedman, this saved his life in the jungle, although even so he was still regularly afflicted with fevers (1972, pp. 81, 84). Caramaca did for Stedman what mother Catyn did for Titsingh, giving recommendations on a healthy lifestyle in the tropics that could be put into practice and understood within the ideas of educated Europeans on climate and constitution (Figure 3.3).

Conclusion

From Titsingh and Mother Catyn to Stedman and Caramaca, we can see that in the hot climates the Dutch continued to tap existing lay expertise in order to adapt their lifestyle to the heat of the air and its putrefying and rotting consequences. This adapting of lifestyle to the climate was an eminently pragmatic and empirical process. At the same time, it took place within a perspective on health and disease that was profoundly influenced by Hippocratic ideas of the non-naturals and of the relationship between climate and constitution. There was of course no alternative perspective possible before the rise of bacteriology. And even when this alternative did arise, the precepts of adapting lifestyle to climate would change very little.

In his book *Against Method*, philosopher Paul Feyerabend based himself on the history of science to conclude that science does not progress through fixed methods. On the contrary, the history of science shows a kind of "anything goes": what works in a given situation, works, and afterwards people will theorise about the why and how (Feyerabend, 1975). To some extent, the history of the seventeenth- and eighteenth-century "adventurer-scientists" and their adaptation to the hot climates is an example of this kind of "anything goes." Their search for knowledge was not theory-driven, but pragmatic and opportunistic: what seemed to work, worked. But this search did and could take place in a fruitful way because of a mindset influenced by the traditions of classical medicine with its flexibility of concepts, its emphasis on the local nature of

knowledge and practices and its understanding of the interplay between climate and constitution. In the adaptation and acclimatisation of the Dutch to the tropical climate, the influence of the Hippocratic tradition with its search for a balance with nature and for learning the lessons of nature was all-pervading.

Note

1 The Society of Suriname was a company ruling the colony of Suriname and had among its main shareholders the WIC and the city of Amsterdam.

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Part 2

Food and drink



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4 Eating after the climacteric

Food, gender and ageing in the long eighteenth century

Elizabeth A. Williams

Throughout history human beings have been concerned about how to stave off the process of getting old or at the least – when they accepted the inevitability of ageing and death – of slowing the process and making it as painless as possible. Across the millennia in which people have pondered such concerns, the role of food and drink in preserving health and preventing or curing illness has been highly significant. In this respect, strivings for "healthy ageing" have differed markedly from efforts at "rejuvenation" or securing immortality. The latter quests have mainly not involved the prosaic business of eating and drinking but have entailed, instead, the use of magical elements such as the philosopher's stone or the fabled fountain of youth (Bourlière, 1977, p. 6.83). Even today, amidst a mounting mania for "healthy eating," those who seek immortality – such as the Silicon Valley entrepreneurs who recently declared in the *New Yorker* magazine that they have no intention of dying – put relatively little stock in careful management of eating and drinking and other habits. Rather, their hopes lie with such techniques as creating new body parts with the help of 3D printers and other high-tech procedures (Friend, 2017, pp. 54–67).[1] And although throughout history there have always been physicians who promoted forms of rejuvenation wizardry, medical counsel on how to live longer has meant in very large part attending to healthy ways of eating and drinking (see Burstein, 1955, pp. 328–332; Vila, 2018, p. 37).[2]

A notable feature of the discourse of healthy ingestion and healthy ageing in the Western medical tradition is its almost exclusive focus on the eating and drinking of men and the effect of these activities on the male body. In the Hippocratic Corpus, mentions of women's eating usually involve such concerns as the transformation of ingesta into menstrual blood (King, 1998, pp. 29, 69, 73). And while Galen gave extensive dietetic advice to males, he referred to the eating of women or girls only rarely, generally either to point to foods helpful in stimulating menstruation or to disparage the unwise or "silly" uses that females made of food, as when they transformed foods into cosmetics.[3] Similarly, early modern texts on the art of longevity spoke to the needs and practices of males.[4] This situation changed only with the rise of medicine focused on what were called the "maladies of women," a genre that first emerged in Renaissance Italy and then reached new heights in late Enlightenment France.[5]

This medical literature about and for women and their physicians emphasised the stages of female reproductive life – puberty and the onset of menstruation, sex in marriage, pregnancy, childbirth, and lactation. But the authors of such works also often commented on the situation of women who had ceased menstruating and moved towards the final stage of their existence. In any event, all such works on the maladies of women and the prospects – for women – of healthy ageing gave at least some attention to eating and drinking. It could hardly have been otherwise given that, at the most fundamental level, Western medicine from Antiquity to the nineteenth century was to a large extent based on food and drink. And while dietetics was always an important element of medicine, its significance increased with the "Hippocratic revival" that got underway in the early modern era (Cantor, 2002). This movement gave new prominence to Hippocratic teachings about the general process by which the "humours" were produced in the body through the transformation of things ingested as well as the specific bodily effects of particular foods and drinks.[6] In the literature devoted to women's special ills, this meant close attention to the Hippocratic view that the essential humour in women was menstrual blood just as the essential female organ was the womb (King, 1998, p. 69). Thus, assessments of female eating patterns and proclivities emphasised their relation to women's reproductive life, including its dramatic cessation with the climacteric. One leading authority claimed to follow Hippocrates in recognising that a woman's life was "un foyer d'infirmités et de douleurs"; how efficacious a careful regimen of food and drink might be in mitigating these woes and extending women's lives was, for this physician and others, an important concern (Gardanne, 1821, p. vii).[7]

My focus in this chapter is, then, the role of food and drink in the process of female ageing, specifically during and after the onset of the climacteric, from the late Enlightenment to the 1840s, dates which, in this medical domain, are at one end of the "long eighteenth century," which is the focus of this volume. This era is distinctive for several reasons. First, medical thinking about healthy eating and drinking for ageing women was situated in these years within the first sustained treatments of the condition called "menopause," a term coined by a French physician in 1821. Certainly, physicians had commented in previous eras on this "critical time" in women's life experience, but it was in the late Enlightenment that focused debate came to surround the phase of women's life in which the end of menstruation was the dominant feature (Stolberg, 1999).[8] The special dietetic requirements of this stage of life were an important element of this new discourse of "menopause." Second, medical thinking about food and drink appropriate to women during and after menopause shifted in important ways from the 1840s onward as physicians in the emergent field of gerontology merged the problem of menopause with general investigation of the ageing process. Such physicians tied their enquiry to the larger movement to achieve progress in medicine and to give the field firm scientific moorings by relying on procedures developed in the dissecting hall and the laboratory. Early in the century, this chiefly meant pathological anatomy, which had achieved

new importance from the later eighteenth century onward but was first put to systematic use in the study of ageing in the 1840s; physiological chemistry, cellular and metabolic physiology, and neurology followed suit. With these developments, proponents of "scientific medicine" sought increasingly to elide strongly gendered differences in the process of ageing, encouraging instead uniform, gender-neutral explanations for ageing and for preventative and therapeutic measures targeting the old, measures in which dietetics nonetheless remained central. Thus, while medical traditionalists, usually bedside physicians, continued arguing for the special impact of food and drink in female and male bodies, notions of the gendered particularity of ageing, and the special dietetic needs of older women and men, began to recede under the influence of advancing medical and biological science on the development of these fields.[9]

Given the powerful sway of ideas of gender dimorphism in the late eighteenth and early nineteenth centuries, it might be expected that medical thinking and prescriptions in regard to the impact of food and drink on ageing male and female bodies would reveal a sharp contrast. But, as a range of pertinent medical texts reveals, this was not in fact the case; indeed, working from these texts, it is impossible to speak, in regard to the impact of food and drink, about any singular model of the female body.[10] Instead, the literature that addresses eating after the climacteric constructs and targets many different female bodies that varied with a host of divergent circumstances. Accordingly, physicians prescribed differing regimens of food and drink dependent on whether the body in question was that of a single woman, a married woman, a childless woman, or a mother; a woman whose original menstruation had been early or late, problem-free or deeply troubled; a woman who was conjugally faithful or lascivious and promiscuous; a woman who lived in the country or the city; or a woman whose temperament was sanguine or bilious, "lymphatic" or nervous, and so on. Of the notable differences that separated the kinds of women and kinds of female bodies that fell under the medical gaze, two were of particular importance to physicians who counselled women about appropriate eating and drinking in and after the climacteric: first and foremost, a woman's reproductive history and current status, and second, a woman's temperament, which reflected her humoral constitution, of which the state of the blood – and particularly menstrual blood – was an essential component of women's health (Tissot, 1810, pp. 430–453)[11] (Figure 4.1).

Until recent years there was essentially no historical scholarship on the issue of menopause or the climacteric, but, thanks to recent investigations, we now know a good deal about the terminology and thinking found in discussions of this phase of female life. Into the eighteenth century, the noun "climacteric" was used in medicine for any critical phase, or even a single year, in human life when something decisive or irrevocable happened in regard to an individual's health. Gradually this broad usage gave way to one in which "climacteric" indicated the point at which people – male or female – began to experience decline in their strength, capacities, or "vital force" (Halford, 1813, pp. 317–319, 323).[12] This usage continued into the nineteenth century, although as



Figure 4.1 Drawing of an ageing woman of "beneficent" disposition. Published in Lavater's *Essays on Physiognomy* (1789). Courtesy of the Wellcome Collection.

time passed the term "climacteric" came to be used especially for women and to be taken as more or less synonymous with what was also called the "critical age," in English, the "change of life," whose most important feature was the cessation of menstruation.

The term "menopause," by contrast to "climacteric," has a definite historical point of origin: it was coined by the French physician C.-P.-L. de Gardanne, who first invented the neologism "ménespausie" but then replaced that word with "menopause," a term that took hold quickly in French but in English supplanted other terms ("decline of life," "change of life") only in the late nineteenth century (Gardanne, 1821; Wilbush, 1979).[13] The term "menopause" captured what physicians had long taken to be the most significant element of the transition from youth to age in women, the cessation of menstruation. As is well known, physicians regarded "regular" menstruation as the most important element of the health of pre-menopausal women and "irregular" menstruation – which could mean precocious or late in original onset; excessive or scanty in amount; too short or too long in duration; deviating from the ordinary monthly cycle; or, worst of all, wholly suppressed – as

a leading, even the most important, cause of their ill health (Tissot, 1810, pp. 435–437). Given that suppressed menstruation occurring before menopause was a source of great alarm, it is scarcely surprising that the end of menstruation was often regarded as a time of great difficulty and danger for women. The French physician Nicolas Chambon de Montaux, author of a multi-volume work on the maladies of women published in assorted editions in the 1780s and 1790s, included in the volume he dedicated to menopause chapters on plethora, haemorrhages, cancerous ulcers; diarrhea, sweats, and haemorrhoids; cachexia, hydropisia, maladies of the chest and head; gouty and rheumatismal ills; nervous affections; and a great variety of ills of the uterus, ovaries, and tubes (1799, pp. 417–420).[14] Gardanne regarded menopause as similarly perilous, listing over 50 diseases "ordinarily observed at the epoch of menopause" that included assorted fevers; inflammations of the skin, joints, eyes, liver, and uterus; ulcers, cancers, cysts, and polyps of the reproductive organs; disorders of the blood; pains of head, ear, and teeth; disorders of excretion and secretion; and nervous ills, including epilepsy, hypochondria, and hysteria (1821, pp. 208–447) (Figure 4.2). In 1851, the English physician E. J. Tilt, who had studied in Paris and who drew heavily on the work of his francophone predecessors, characterised the problems that women suffered at the "change of life" as "pertinacious, complicated, and shrouded in … misty confusion" (1851, pp. 109–110).[15]

Despite such dire assessments of women's liability to disease at the climacteric, claims that the menopause was "natural" or even largely problem-free were also a constant of medical literature in this era. Those who regarded menopause in this light sometimes saw it as the natural point of division between two phases of female life: the years preparing for and marked by reproductive capacity and the second half of life in which this capacity was lost. This view of the key point of division in women's lives raises the question of whether those lives, whatever their complicated variety, fit, overall, into the "ages" or "seasons of life" physicians perceived in charting the life course of males seen as the model of the human. These "seasons of life" schemes also varied widely.[16] Mirko Grmek points out that an ancient binary divided life into youth and age, a bifurcation that linked the human life course to the natural dualities of light and dark, night and day, and so on. In the early modern era, many versions of the "ages of life" simply divided the life course into decades (Grmek, 1958, p. 23; von Kondratowitz, 1991, pp. 140–141). Other schemes, such as that advanced by the famous anatomist John Hunter, held to a tripartite division of youth, middle age, and old age. Hunter stressed that the stages of "a man's life" saw "gradual and imperceptible" changes from the first to the second and the second to the third, "so that there is no particular period between any two of them, whereby we can terminate the one and begin the other" (Pearl, 1929, p. 569). Still another construct established the "ages of life" as four in number – childhood, youth, maturity, and old age. This scheme, like Hunter's, generally took the male as the model and perceived gradual changes marked by nothing so dramatic as the cessation of menstruation in women.[17] And yet, here

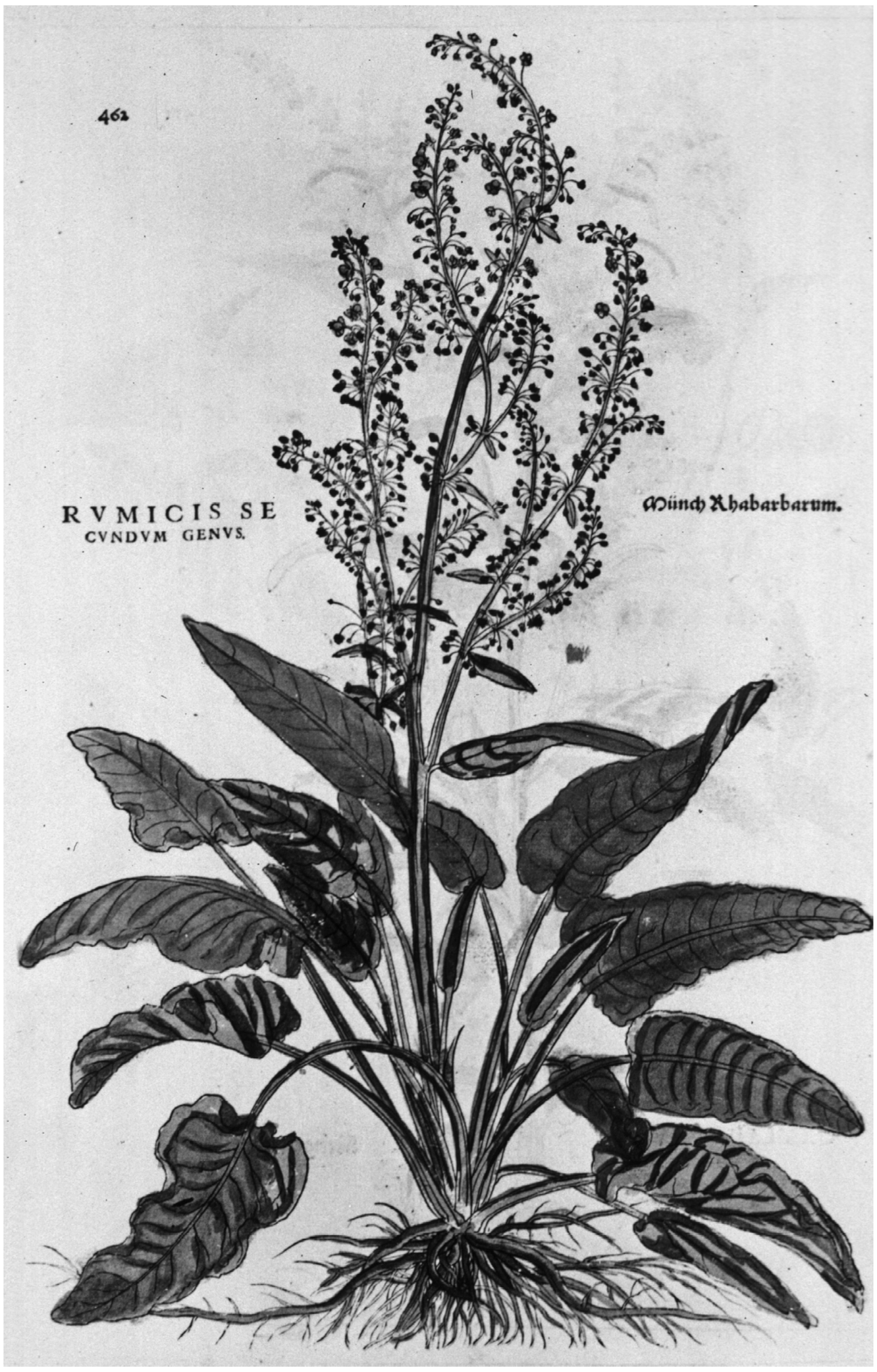


Figure 4.2 Rhubarb, as illustrated in Leonard Fuchs' *De historia stirpium* (1542). Courtesy of the National Library of Medicine. Rhubarb was a purgative thought suitable for menopausal women.

again, there were no absolutes. Another scheme for dividing life into different phases attended to the so-called "septennial phases" – periods of seven years – and at least one physician of the early nineteenth century saw these septennial phases unfolding in the lives of both men and women (Johnson, 1837, p. 122).[18] Where women fit into the "ages of life" was often a theme that required a lot of juggling, especially when physicians encountered cases, as some said they did, of women who never definitively stopped menstruating. One such case reported in the early nineteenth century concerned a woman who ceased menstruating but then, after a hiatus, menstruated again from age 75 to 98, enjoyed another

break but had periods again from age 104.[19] Here was a female body that, in this respect at least, fell into none of the established models of "the ages of life."

Given these many variations, these many female bodies, can any general rules about the use of food and drink in fact be found? Before turning to specifics, I want to stress the general point that when we isolate one of the non-naturals from the others, abstracting food and drink or any feature of hygienic or therapeutic programmes from all the others, we do some violence to the holistic character of pre-modern medicine. Physicians from the Ancients to the nineteenth century emphasised that proper regimen took into account all the non-naturals simultaneously. Thus Friedrich Hoffmann, in giving dietetic advice intended to lengthen the lives of the old, male and female, made detailed recommendations on food and drink, air, bodily movement, and the passions (Schlöder, Schochow, and Steger, 2014, p. 255). New schemes offered just after 1800 by hygienists such as J.-N. Hallé, who held the chair of hygiene in the Paris faculty from the Revolution to 1822, shifted away from the classic arrangement of the non-naturals into six components, adding new themes such as the impact of baths and different types of clothing on health, but the traditional six continued to be amply covered.[20] This pattern of retaining the non-naturals of the Ancients while adding topics of special interest to women became a characteristic feature of the menopause literature: when Tilt laid out a "Regimen" for menopausal and postmenopausal women, he dealt first with diet, then with air, exercise, sleep, dress, bathing, and conjugal relations (1851, pp. 102–110). Tilt did not say explicitly that these factors were closely interrelated, so that error in one could overthrow good efforts in all the others, but I believe it was part of the "tacit knowledge" of pre-modern medicine that all elements of regimen worked together. Whether this meant that there was no hierarchy of significance, that the non-naturals were all of equal importance, is a difficult question to judge. But in respect to the perils of menopause there can be no doubt that many physicians saw faulty ingestion – eating and drinking, as one physician put it, by "patients [who] cannot be induced to live appropriately, but will gratify the appetite, at whatever risk" – as the source of a patient's failure to avoid or recover from maladies of the "critical age," however expert their "management" by the physician (Ashwell, 1848, p. 151).

So what, then, are some prescriptions in regard to eating and drinking that physicians made for women during and after the climacteric? In the 1770s, the Quaker physician John Fothergill, one of the physicians of these years who sought to undercut old ideas about menstruation as the evacuation of malignant matter, observed that some women moved through the climacteric with the "least interruption" to health while others became plethoric and required either bleeding or modification of diet to reduce the volume of blood in the body.[21] Fothergill urged that such women avoid meat and animal food, that on two or three days a week they eat only "pudding" and vegetables, and that they consume only moderate liquors. For those with "immoderate fluxes," he proposed "a most sparing diet" and the use of light cordials such as wine. Fothergill did not exactly say, but he seemed to imply that both of these

possible conditions were common: the healthy woman who could go on eating and drinking as before and the plethoric woman who must be prudent in eating and drinking to prevent or resolve humoral imbalance. But he also took note of the anomalous condition of women who had stopped menstruating but later came to believe they were pregnant. Such women, he observed, tended to indulge what he called "appetites, often craving and depraved," though he did not stipulate whether such disordered eating desires were the well-known cravings characteristic of pregnancy or some especially perverted form of craving seen in women who claimed to be pregnant when in fact they were no longer fertile (Fothergill, 1774, p. 182).

Overall, Fothergill came to be known as a physician who argued for the generally benign character of the female climacteric and urged that heroic measures were unnecessary. By contrast, the French physician Claude A. Goubelly, writing about a decade later, represented the "critical time" as serious and dangerous, noting the menopausal woman's heightened sensibility; proneness to extreme, sometimes violent emotion; liability to diverse and "marked derangements" of brain, womb, and other bodily parts. Unlike Fothergill, he gave explicit instructions on foods that must be avoided, including mutton and pork; ragoûts, fricassees, and heavy soups; as well as bread, café au lait, and spirits (Goubelly, 1785, pp. 2.368, 2.379–2.380). Goubelly's stance reflects several special factors at work in French medicine of the period. One of these was a general sense of the unsuitability for women of the highly elaborate concoctions of French *gastronomes*.[22] Another was the broad influence exerted by a vitalist-inspired, holistic view of women's nature and capacities that saw women as differing from men not only in anatomy or physical strength but in every part of their being. The latter view encouraged physicians both to see women as essentially different from men and to express heightened concern over the potentially pathological implications of female difference.[23] Indeed, although French physicians concerned with menopause expressed eclectic theoretical debts, it was chiefly this vision of woman that explains why French physicians took the lead in devising a special language of "menopause" and in pursuing the theme more intensively than elsewhere.

At the same time, however, the vitalist inspiration of French works on menopause created a quandary for physicians who hoped to give reliable guidance on questions surrounding food and drink. Vitalist teachings gained wide credence in this era in part by breaking with images of the "body-machine" that had held sway for some time and by emphasising how essential it was for physicians to take account of the infinite number of circumstances involved in particular states of health or illness. This meant that laying down hard and fast rules in respect to any condition, malady, or "phase of life" was impossible. Instead, physicians should seek to discern patterns that would aid in diagnosis and prognosis while recognising that a multitude of factors could subtly influence the physico-moral state of any individual patient at any time. All of this was pre-eminently true of women, whose internal states and actions were seen

to be highly volatile (Williams, 1994, pp. 9, 50–53, 54–62; 2003, pp. 161–162, 215–216, 218–219, 227, 230–247, 331).

In regard to the "critical time," these vitalist principles meant that physicians must strive at one and the same time to offer general guidance on diet and other matters and yet be attuned to manifold variations in the particular course of menopause in a particular type of woman. Such tensions are fully evident in the medical dissertations devoted to menopause around 1800. One of these, the work of a student named Armand, suggests his perplexity in prescribing an appropriate diet for women whose constitution and circumstances inevitably showed great variety. This author laid out in great detail the differences between city and country women, spinsters and mothers, and women of sanguine or melancholic temperament that I alluded to earlier. Yet, despite his close attention to variety, when Armand offered recommendations on eating and drinking, he proposed a regime that seemingly held good for women in general. It was his claim, for example, that overall women had a "natural penchant" to sobriety and to eating such mild foods as vegetables and the flesh of young animals. Thus, he urged, women should follow their natural bent and diminish either the number of meals or the overall quantity of food ingested, drink only light wine cut with water, eat only fruits of good quality, avoid crudités and the excesses of a milk diet, and take care not to abuse such dangerous ingesta as pastries, sugar, tea, and coffee (Armand, 1820, p. 13). This last reference to potential abuse suggested Armand's quandary in wending his way between the general and the particular. Women generally were sober and restrained but some – or maybe all women at some times? – were inclined to abuse the pleasures of food and drink.

Other writings on menopause reflected the same tension between prescription for women as such and women whose nature and experience varied widely. Gardanne, who provided elaborate detail on the beneficial or deleterious qualities of foods and drinks consumed during menopause, began by urging general rules: as the cessation of the menses approached, women must adopt "a gentle and moistening regime" and take care not to "fatigue the stomach by consuming but a single meal." But he then proceeded, in surveying specific foods from starches to meats to chocolate, to tailor his recommendations to different kinds of women, especially in accord with temperament (only those of "lymphatic" temperament, for example, could eat sugar with relative impunity) (Gardanne, 1821, pp. 136, 157). Similarly, a later French author offered some recommendations for women in general, urging those at the "critical age" to reject strong meats and spicy foods, dispense with the evening meal, and avoid undiluted wine, liqueurs, and coffee, while nonetheless offering as a special recommendation for "nervous women" that they avoid "farinaceous foods" that caused flatulence and intumescence (Poquillon, 1846, p. 18). The English physician Tilt also made clear that no uniform rules in respect to eating and drinking could be laid down. He observed, for example, that one woman of nervous constitution required a "strengthening diet," while another who suffered much from constipation was limited to meat once a day, no beer or

porter, and only one glass of sherry at dinner (Tilt, 1851, pp. 14–15). Like Gardanne, Tilt gave special attention to the influence of temperament:

> [W]hile the lymphatic and the nervous need make no change in their mode of living, the sanguine … would do well to put themselves on Lenten fare, to dine off the lighter kinds of fish two or three times a week; and … to make the principal meal at the fashionable luncheon-hour of 2 o'clock, in order that the last meal may be a very light one.
>
> (Tilt, 1851, p. 103)

Overall, then, it seems that dietary rules were enunciated only to be modified in particular circumstances.

Given this persistent attention to variety and difference, why and how, it might be asked, were any general guidelines possible? Here I would suggest that – aside from their grounding in ancient medical tradition, both the general doctrine of temperament and specific teachings such as Galen's claim that eating meat or drinking strong wine increased the production of blood in the body – medical recommendations often had as their general goal getting women to eat "naturally," that is, in accord with hunger and physiological need rather than desire or pleasure. Thus this medical discourse aligns closely with other elements of Enlightenment medicine in which an implicit distinction between nature and culture, bodily need and bodily desire, helps to explain assorted pathological conditions. The discourse of the climacteric bears great resemblance, for example, to that of the famous "vapours," that peculiar malady of the late Enlightenment and early nineteenth century that blended physical and moral ailments and had as the principal victims highborn and highly sensitive women.[24] A constant refrain in both literatures – that of the climacteric and that of the vapours – is that ills associated with these conditions were seldom or never seen in women who led a "natural" life. In respect to food and drink, this meant that country women – women who laboured, became legitimately fatigued, and satisfied natural hunger with "simple" foods – did not suffer the upsets or the life-threatening pathologies of sophisticated city women who ate and drank as part of a pursuit of pleasure (Beauchêne, 1781, p. 6; Gardanne, 1821, p. 135). This nature versus culture theme was especially vivid and widespread in late eighteenth-century France, when fears of the deleterious effects of urban life and of the "unnatural" behaviour of women devoted to the pleasures of the city were widely expressed both in medical discourse and broader cultural commentary. One typical case reported by a prominent analyst of vaporous ills involved a woman of 45 or 46 who was 10–12 years past the "temps critique" and who suffered from chronic symptoms ranging from difficult urination to abdominal pain to general nervous disturbance. The remedies this physician offered to this victim of prolonged menopausal suffering included "highly active" purgatives but concentrated on "natural" balms and vegetable preparations that in time gave lasting relief (Beauchêne, 1781, pp. 163–168).

Another refrain that pervades these medical texts is the potential dangers posed to menopausal women of carnal pleasures, both ingestive and sexual, though here again the question of whether women at the critical age still experienced strong bodily desires often brought contradictory answers, sometimes on a single page. Opening his discussion of treatment and regimen for women at the "temps critique," Goubelly said, for example, that women at this stage of life were more sensitive, easily irritated, and indifferent to pleasure. This would seem to imply that women were more sensitive only to unpleasant features of their environment than they were to things that brought pleasure, such as delectable foods and drinks. But three sentences later Goubelly stated, despite his claim that menopausal women were indifferent to pleasure, that in women at the climacteric, appetite intensified, and that such enjoyments as coffee, wine, and liquors that were once simply pleasurable habits became necessities they could not live without (1785, p. 363). A similar contradiction is evident in the thesis of Armand, who, as I pointed out earlier, on the one hand claimed that women had a natural penchant to eat lightly and simply and, on the other, warned them against abusing sweets, pastries, and café au lait. In this literature, the same ambiguity is to be seen in respect to sexual desire: the climacteric, some physicians said, was the moment when women necessarily renounced the pleasures of love and devoted themselves to children and relatives and yet it was often a time when women were consumed by desires they could no longer satisfy.[25] The same inconsistency was true of eating desires: some women still avidly sought the pleasures of food and were required to curb their appetite in the interest of health, while others became as indifferent to the pleasures of eating and drinking as they were to sex. The latter were at risk of failed appetite and the full range of ills attendant on anorexia.[26] Certainly this condition – loss of appetite and reluctance or refusal to eat – is widely documented among older women in the asylum literature of the era, a medical context quite different from that of private practice with middle- or upper-class women that was the norm for physicians who sought to build reputations as experts on the climacteric.[27]

Finally, the last question to consider is whether these notions of "natural" eating and the dangers of indulging bodily pleasure encouraged styles of managing food and drink for menopausal and postmenopausal women that differed significantly from those proposed for men at the same age. Certainly, one can find in the medical literature of ageing innumerable medical prescriptions that counselled men, like menopausal women, to eat "naturally" and in accord with the demands of hunger rather than the desire for pleasure. In the literature of longevity that focused on men, they too, like menopausal women, were told to moderate, or in some cases radically restrict, what they ate and drank if they wanted to live long. Hoffmann recommended, for example, that older men drink water, mineral water, or sweet wine but not beer and that they avoid "hard, distending, sour, and salty foods" (Schlöder, Schochow, and Steger, 2014, p. 255). Indeed, the importance of moderation in eating for ageing men was a constant from Galen to the Renaissance

physicians to such nineteenth-century figures as James Johnson, a physician to King William IV who proclaimed the rule "KEEP THE BODY ACTIVE, AND THE STOMACH EMPTY" (1837, p. 106).

So, were there differences in "healthy eating and drinking" for women and men in these years, and if so, what are they? An element of this question not touched on so far is the notion, found in a number of works on menopause and after, that from the climacteric onward a woman essentially becomes a man or at least comes to resemble a man in many respects. With menstruation at an end, and with it childbearing capacity, a woman, some physicians said, enjoyed better health, a new capacity for serious mental application, stronger judgment, even, some said, a new capacity to wield public power and influence.[28] Was there, then, a dietetic equivalent, a sense among physicians that in regard to food and drink the sexes – and prescriptions appropriate to them – converged? Here, I think the answer is, eventually, yes. Although during the years of the climacteric itself women had to be mindful of the effects of all manner of dietary aberrations, the equivalence between the male and female "economy" became more pronounced as the years passed and as true "old age" set in. This view is evident in the new medical literature devoted specifically to old age that began to proliferate from the 1840s onward.[29] One founding work of gerontology was that of the French physician Clovis-René Prus, who, in a review of the "diseases of old age" published in 1840, made no distinctions between men and women as he surveyed what he saw as the characteristic ills of people past the age of 60. And at some points, as when he discussed pulmonary disease, he explicitly denied that there were differences to be seen between men and women (Prus, 1840). In addressing indigestion and other ingestive and digestive ills, moreover, Prus enunciated one simple rule: "A small quantity of nourishing foods that are easy to digest" was all the aged need or should consume, men and women alike. Prus also observed that the old, women and men, chose their foods in accord with the "feebleness whose progress they feel each day" (1840, p. 16).

This equivalence was even more pronounced among German physicians, who, in any event, had participated only minimally in creating a special literature of menopause. Another founding work of the new gerontology was Karl Friedrich Canstatt's *Die Krankheiten des Alters und ihre Heilung* (1839). Although at times Canstatt focused on different masculine and feminine features of health and sickness in the ageing, overall he referred simply to "the old" or to "old people" (Figure 4.3).

In charting the digestive troubles in the old that required a special dietetics, moreover, Canstatt discussed "involutional" processes that marked male and female experience equally: loss of the contractile power of the stomach; neutralisation or acidification of the gastric juice; diminished influence of the vagus nerve, which was thought to stimulate both ingestion and digestion; and related functional disturbances (1839, pp. 1.67–1.73). Canstatt devoted a special section of this work to the significance of the "climacteric period" in the ageing process, and for the most part even this discussion targeted females

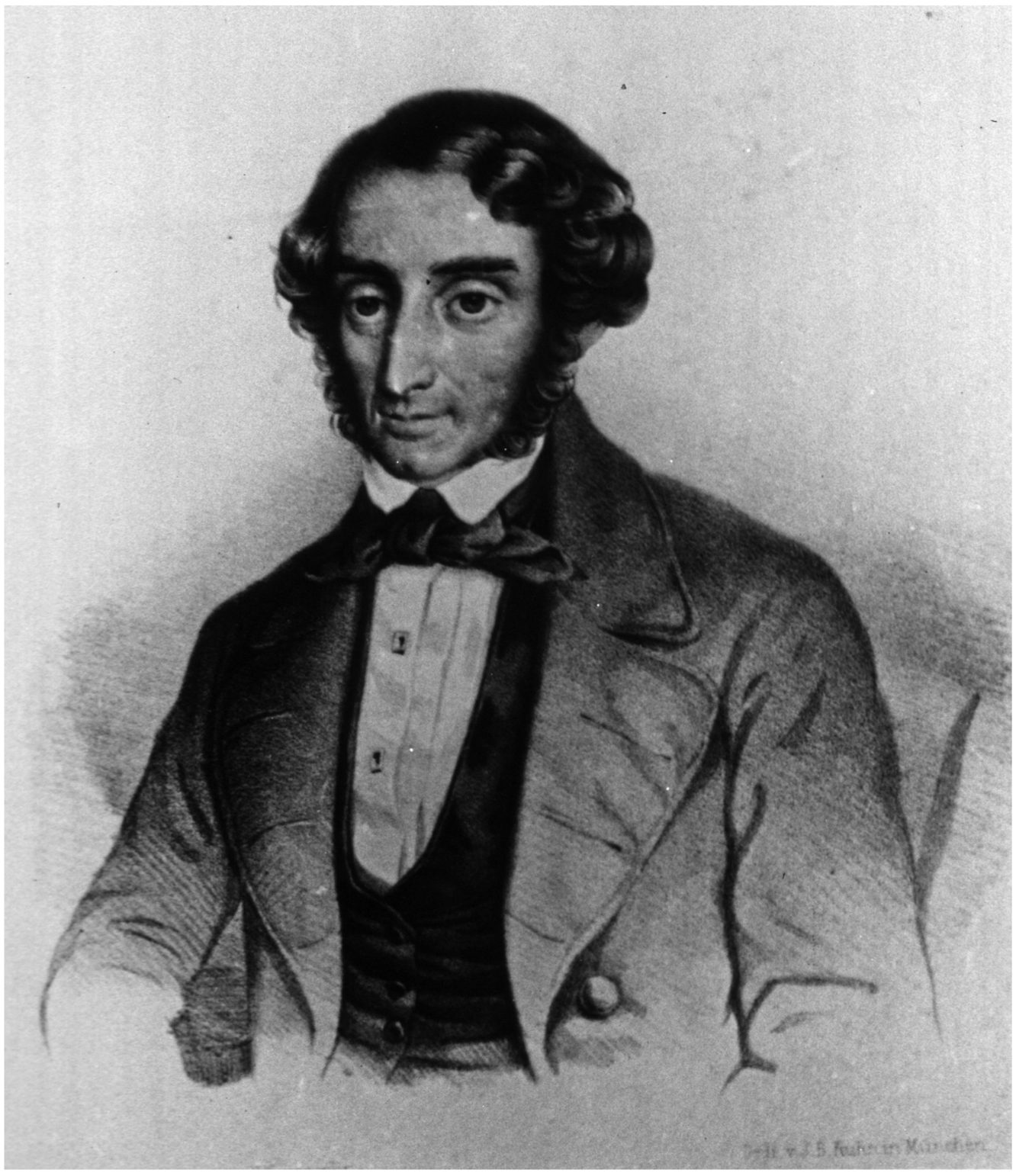


Figure 4.3 Lithograph of Karl Friedrich Canstatt (1807–1850). Courtesy of the National Library of Medicine.

and males alike, as when he observed that the atrophying reproductive organs of both sexes – uterus, ovaries, breasts, and testes – became preferred sites for the development of malignant growths (Pseudoplasmen) in the old (1839, p. 1.93). Like Prus, Canstatt called for the mobilisation of new scientific methods in study of the ageing process: chemical and microscopic analysis of body fluids and excrements, animal experiments to gauge the effects of sectioning the vagus and other nerves, and comparison of degenerative processes in the old to nutritive and other functions in plants and animals (1839).[30] This does not mean that Canstatt saw no differences between women and men during and after the climacteric. He noted that women reached the climacteric earlier than men, that the process overall was "sharper" in women than men, and that women were more prone to illness in this period. Yet, even in respect to the cessation of the menstrual flow, Canstatt drew at least a partial analogy to the experience of men, noting that in men who habitually suffered haemorrhoids, this bloody evacuation often ceased at the time of the climacteric.[31] The same held true for Canstatt's therapeutic recommendations. Even with a condition such as dysphagia that he described as more common in women than men, his

dietetic counsel was uniform: avoid enervating drinks such as tea and coffee but consume, in small quantities, milk, arrowroot, gelatin, and thin meat broths (1839, pp. 2.251–2.255).

Yet, while much evidence can be found along these lines, the idea that the climacteric wiped out essential differences between female and male experience in respect to food and drink seems questionable if viewed in light of long-standing views of strong differences in the female and male appetite for food. Throughout the Western medical tradition, females were repeatedly charged with indulging strange or perverse appetites. In Antiquity both myth and medicine said that women's appetites, especially the erotic but also the appetite for food and drink, were excessive or depraved, and from the early modern era onward physicians described in girls and women eating aberrations that were either never or seldom seen in men.[32] One of these was the disease of "green-sickness" or chlorosis, whose features included pica, the consumption of such substances as unripe grain or fruit, chalk, clay, or dirt; the other was self-starvation, a condition famously seen in girls or women but rarely in men.[33] The question is, then, did physicians see these noxious female tendencies vanishing with menopause?

Once again, the answer appears to be "yes" and "no." Let me start with the "no" – not all special female dispositions toward food and drink and conditions linked to them were thought to disappear after the climacteric. Although chlorosis was chiefly regarded as a malady peculiar to young women, some physicians documented it in older women as well.[34] The same was true for pica, which did occur independently but was usually regarded as the most striking feature of chlorosis. Although physicians mainly regarded pica as a practice of girls and pregnant women, they reported it for menopausal women as well (Hoover Edwards, McSwain and Haire, 1954).[35] Gardanne discussed cases of pica that appeared at menopause, ordinarily in women who had suffered from the affliction at puberty. He held that this "corruption of taste" varied infinitely, listing as particular objects of perverted alimentary desire "earth, lime, plaster, green fruits, vinegar, rotten leather, old linen, thread, spiders, [and] raw meat" (Gardanne, 1821, pp. 421–425). There is also considerable evidence that even well past the climacteric extremes of undereating were seen as more common in women than in men; both sexes were troubled by loss of appetite, but it was women who more commonly refused food and suffered gradual emaciation (see Beauchêne, 1781; Gardanne, 1821).[36]

So, it seems that physicians saw at least some female–male differences in respect to eating and its bodily consequences remaining into advancing age. On the other hand, as I suggested earlier, physicians seemed to agree that as men and women aged, especially after they reached age 60, they came to resemble each other in respect to eating propensities and appropriate diet, as in many other respects. The experience of aged people supplied many grounds for this assessment, some distinctly prosaic and others that verged on the metaphysical. Among the anatomically straightforward reasons why women and men had to follow the same dietary prescriptions in old age was the fact that both old men

and old women lost their teeth and had problems masticating. Thus, it was the case, in the words of the French hygienist J.-H. Reveillé-Parise, that the aged must limit themselves to foods that are "tender, well prepared, and require[e] only moderate chewing" (1853, p. 331). The semi-metaphysical reason why the sexes converged in old age was eloquently stated by Canstatt when he characterised the old as first becoming plant-like (losing the "animal privilege of moving freely on the earth" and thus the capacity "not to be bound by fixed roots") and then as "partially petrified," assuming the status of inert objects devoid of feeling and movement. His like-minded colleague Prus said much the same when he lamented "the progress of age, which tends unceasingly to bring the constituent parts of the human body nearer to [the state of] inanimate matter" (Canstatt, 1839, pp. 1.1–2; Prus, 1840, p. 25).[37] Here, at last, was a universal truth: no form of food or drink could save male or female from the ultimate common fate of leaving the organic for the inorganic realm.

Notes

1 Friend also discusses manipulation of DNA, replacement of old cells with young ones, and other techniques.
2 See Vila on the famed Enlightenment physician S.-A.-D. Tissot who devoted over half the pages of his treatise on preserving the health of men of letters to food and drink; see Burstein for a brief survey on pertinent texts from Antiquity to the twentieth century.
3 When Galen discussed eating in relation to occupation, he referred only to work performed by men, and at several points he commented specifically on the needs of "lads" in their first second, or third "seven years" (ages 1–7, 7–14, and 14–21). For Galen's advice to males, see Galen (1951), pp. 53, 90, 92, 172, 229. For his comments on the eating of women and girls, including their use of beans to make facial powder and their childish taste for "jujubes," see Galen (2000), pp. 85, 98, 134, 143.
4 On early modern works of "prolongevity hygiene," especially the work of Luigi Cornaro, see Gruman (1966), Grmek (1958), and Burstein (1955). Mentions of women in early modern works on longevity generally focused on the effects on men of "commerce with the sex," see Mackenzie (1758, pp. 112, 116, 136, 137).
5 For works from the fifteenth to the seventeenth centuries, see Stolberg (1999). Enlightenment works in the genre in France include those of Astruc (1761–1765); Goulin and Bréchillet Jourdain (1771); Chambon de Montaux (1784); and Goubelly (1785). A work that straddled several genres but included many medical themes was that Moreau de la Sarthe (1803).
6 See Schlöder, Schochow, and Steger (2014) on the significance that the Halle physician Friedrich Hoffmann attached to proper diet in maintaining healthy consistency and flow of the humours.
7 This was the second edition of Gardanne's *Avis aux femmes qui entrent dans l'âge critique*.
8 Stolberg shows that the earliest independent publications on cessation of the menses were medical dissertations in Germany completed in 1710 and 1722.
9 By the end of the nineteenth century, the special problems of menopausal women became the province of the increasingly scientised and professionalised specialty of obstetrics and gynaecology (Moscucci, 1990).
10 Men's bodies varied too, of course, but overall were seen as more "regular" in their processes and stages of development; on this point, see the sources on the "stages of life" cited below.
11 "Lors même que les règles sont venues, elles se suppriment souvent, et il n'y a aucune maladie que cette suppression n'ait produite" (Tissot, 1810, p. 434).

12 Halford saw the "climacteric disease" as primarily male rather than female and noted as the chief symptoms a "falling away of the flesh," a "quicker pulse than natural," an "extraordinary alteration in the expression of the countenance," fatigue, thinning, serious impairment of the appetite, sleeplessness, head and chest pains, swollen legs, sluggish bowels, and headache (1813, pp. 317–319). He surmised that "the change which the female constitution undergoes at the cessation of the catamenia may render subsequent alterations less perceptible" (1813, p. 323).

13 The earliest use of "menopause" in medical writings in English that I have found appeared in two dissertations prepared at the University of Pennsylvania (see Lee, 1876; Tuttle, 1881).

14 This volume was Part 5 of the second edition of Chambon's *Maladies des Femmes*. Uterine ills at the "critical age" included "erotic embarrassment" of the uterus, uterine congestion, hydropisia, obstruction, cancer, tumours, polyps, stones, warts, and many others.

15 Tilt referred admiringly to his "venerable teacher, Professor Récamier of Paris" (137). J.-C.-A. Récamier (1774–1852) was an important innovator in gynaecologic surgery and helped to popularise use of the vaginal speculum.

16 For an analysis that traces a general shift from schemes emulating classification in natural history and presenting the life stages as entities with distinct psychophysical characteristics to vitalist-inspired, "developmental" frameworks that emphasised the waxing and waning of life-force, see von Kondratowitz (1991, pp. 136–137, 139–141).

17 But one leading authority did delineate four ages of women and stressed the gradualness of the changes from one to another, seeing sudden cessation of the menses as pathological; see Moreau de la Sarthe (1803, pp. 2.359–2.413; on the dangers of brusque cessation, 2:409).

18 Johnson situated the "Grand Climacteric of woman" in the "seventh septenniad," from age 42 to 49.

19 This case, reported in 1817 by Friedrich Ludwig Meissner, appears in Tilt (1851, p. 87). Drawing on early modern authorities from Roderigo de Castro to Albrecht von Haller, Gardanne cited cases of women menstruating to the ages of 60, 70, 75, 100, and 106. His claims were repeated, sometimes verbatim, in later medical theses (Gardanne, 1821, pp. 19–22; Ripeault, 1848, pp. 7–8).

20 On his debt to Hallé, see Gardanne (1821, p. 86).

21 For an eighteenth-century restatement of the Ancient view that menstrual blood was "vitiated" and of "poor quality," see Stahl (1859–1864, pp. 4.246–4.247); Fothergill (1774). On the late Enlightenment trend to deny the malignancy of menstrual blood, see Stolberg (1999, pp. 414–415).

22 On the gendering of gastronomy, see Spary (2014, pp. 250–251).

23 The *locus classicus* of this theme was the work of the Montpellier-trained Pierre Roussel (1775). For citations in the menopause literature to Roussel and other physicians who were themselves vitalists or influenced by vitalism (including Théophile Bordeu, P.-J. Barthez, Philippe Pinel, Xavier Bichat, A.-B. Richerand, J.-L. Alibert, P.-J.-G. Cabanis), see Gardanne (1821, pp. x, 5, 24, 35, 52, 53, 57, 58, 150); Poquillon (1846, p. 13); Ripeault (1848, p. 22); Chandelux (1850, p. 5). On these figures and on vitalism in France, see Williams (1994, pp. 20–114; 2003).

24 For guidance to the French literature, see Vila (1998); on digestive dimensions of the vapours, see Vila (2018, pp. 96–101, 125–127).

25 Menopause was the moment when women, no longer preoccupied with "voluptés," enjoyed "steadying" of the mental faculties and "heightened energy"; see Poquillon (1846, p. 14). Tilt warned against the perils of sexual activity at menopause, especially for previously virginal women; in evidence he cited a case reported in France of a woman who enjoyed "venereal orgasm" for the first time in her late 40s and fell victim to uterine "irritation" (1851, p.107).

26 For a case of a 50-year-old menopausal woman who lost her appetite and died after being "réduite au dernier degré du marasme," see Barras (1827, pp. 245–247).

27 Both male and female asylum patients lost their appetite and refused to eat, but, while it is difficult to make an exact tally given the varying length and completeness of early case reports, women seem clearly to have outnumbered men in this respect; for Pinel's practice at the Salpêtrière, see Williams (2010); Esquirol (1976, pp. 1.336–1.397).
28 Moreau de la Sarthe said that women's organs became rigid like men's and that sometimes they grew a beard (1803, p. 2.405); see also Gardanne (1821, pp. 53–54); Armand (1820, p. 8); Poquillon, (1846, p. 8).
29 On the rise of gerontology, see Grmek (1958, pp. 69–74); Bourlière (1977, p. 103).
30 See Canstatt, 1839, pp. 1.68–69 on the vagus nerve and pp. 1.71, 90 on chemical and microscopic analysis. Canstatt compared the intestinal canal of nurslings, children, and youths to that of carnivores and of the old to that of herbivores (p. 1.70).
31 Similarly, during the climacteric, both women and men suffered from nose bleeds, cold extremities, and disturbed sensibility and mental function (1839, pp. 1.93–1.94).
32 On female appetites in the Greek world, see Carson (1990, pp. 138, 142, 156). In line with such thinking, Tissot urged close supervision of what young girls ate "puis-qu'il y a peu de corps dans la nature, même parmi les moins propres à servir d'alimens et les plus dégoûtans, qui n'aient été l'objet de leurs bizarres fantaisies" (1810, p. 439).
33 On chlorosis in early modern texts, whose authors asserted a Hippocratic origin for the disease, see King (1998, pp. 188–204); on chlorosis in the nineteenth century, see Loudon (1980); Vandereycken and van Deth (1996). Loudon cites one physician who had seen chlorosis in "the young and delicate of the male sex."
34 Physicians saw cases of chlorosis in later life as "relapses"; see Loudon (1980, p. 1672b); Canstatt (1839, p. 1.94). The context for Canstatt's mention of chlorosis, a discussion of the ways that women's experience at menopause replicated that of puberty, suggests that he believed this a female disorder.
35 For a cross-cultural survey, see Young (2011).
36 On loss of appetite, Canstatt again typifies the gender-neutral cast of emerging gerontology (1839, pp. 1.68, 2.328). He prescribed as counters to failing appetite aromatics, bitters, and fine wines consumed before dinner.
37 On the theme of the old gradually descending to the vital condition of plants and, finally, resembling inorganic objects, see von Kondratowitz (1991, pp. 143–144).

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5 The impossible ideal of moderation

Food, drink, and longevity

Anita Guerrini

> "In a particular manner beware of that word, moderation."
> Jonathan Swift, "On Brotherly Love," 1717 (Swift, 1801, p. 10.64)

The literature on extending the lifespan between Luigi Cornaro (?1467–1566) in the 1550s and George Cheyne (?1671–1743) in the 1720s promoted an ideal of moderation in all things, especially in food and drink. But defining moderation was not an easy task, and its practice varied widely. Cornaro managed to live nearly a century by eating very little. Cheyne, on the other hand, was well known for his excessive girth (he was once described as "three ells round"), and his notion of moderation was similarly expansive. Yet he also advocated vegetarianism for its health benefits. Authors between these two men, including Leonard Lessius and Thomas Tryon, went back and forth between these poles (Albala, 2002, 2012; Cavallo and Storey, 2013; Gentilcore, 2016). As one of the "six non-naturals," food and drink were deeply engrained in Galenic medical theory based on the four humours, and their equilibrium defined health. But as humoral theory waned in the late seventeenth and eighteenth centuries, chemical and mechanical theories of the body came to similar conclusions about the value of moderation in food and drink, even as its practice varied widely.

This chapter will focus on three topics. First, after introducing the concept of moderation, I will discuss some examples of early modern long-life literature and the medical theories that underpinned them, and try to ascertain the boundaries these authors established among asceticism, moderation, and gluttony. Gluttony was one of the medieval seven deadly sins, and Christian teachings – both Catholic and Protestant – underlay the long-life literature. The resemblance of Cornaro's regime to that of ascetic saints was not coincidental. Excess in food and drink was not only unhealthy but also sinful. While gluttony was in itself a sin, Protestant social reformers such as Tryon also argued that excessive attention to oneself was un-Christian and deflected attention from the poor. From the earliest days of the Reformation, gluttony symbolised the excesses of the Roman Catholic Church, an image the Counter-Reformation church strongly resisted. The intersection of Christian

teachings with the Galenic concept of the non-naturals formed the basis of much of the early modern medical discourse of moderation.

Second, by Cheyne's time and place in eighteenth-century England, new substances had entered the diet: not only new foods such as turkeys and tomatoes but also new drinks. Coffee, tea, and chocolate entered Europe in the second half of the seventeenth century and quickly became part of daily life, further complicating the notion of moderation. The coffee house emerged as a popular meeting place in urban areas. Medical men fiercely debated the health benefits of tea, coffee, and chocolate, and by the early eighteenth century, the addictive qualities of these substances began to be noted as well. How did this map onto the earlier literature on moderation? How much should one ingest of an addictive substance like coffee?

Finally, what did moderation mean in this period in quantitative terms? How big was a bottle of wine, and how strong was a cup of coffee? How much food was considered a "moderate" diet? I will conclude the chapter with some investigation into the material culture of food, and especially drink in the eighteenth century.

Moderation as philosophy and practice

In *The Republic*, Plato listed moderation or temperance as one of the four virtues, with justice, courage, and wisdom (2013, pp. 382–389). Classical works on regimen emphasised moderation in food and drink even if they did not employ that term (Edelstein, 1967). The short Hippocratic treatise *A Regimen for Health* stated that diets "must be conditioned by age, the time of year, habit, country and constitution" (Lloyd, 1983, p. 273). Adhering closely to humoral theory, this meant a warm and dry diet of roasted meats and undiluted wine in the winter and a cool and moist diet of vegetables, boiled meat, and diluted wines in the summer. The longer treatise known as *Regimen I* further argued that most diseases were caused either by eating too much, leading to repletion, or too little, leading to depletion (Lloyd, 1983, p. 25).

Some 400 years later, *De medicina* of the Roman encyclopaedist Celsus (c. 25 BCE–c. 50 CE) summarised current views on regimen. A healthy man, he wrote, "should be under no obligatory rules," but live a life of varied experiences. Such a man can attend banquets and even eat too much at times. But this should be balanced with days of lesser consumption (Celsus, 1935, 1.43). Those who are weak, however, must be more cautious; for them, "a surfeit is never of service, excessive abstinence is often unserviceable." However, if one is to be intemperate, "it is safer in drinking that in eating" (Celsus, 1935, 1.49). Celsus added that individual constitutions, as well as age, gender, and place, required particular attention. Here too, moderation was key: "It is not good indeed to overeat after a long fast, nor to fast after overeating. And he runs a risk who goes contrary to his habit and eats immoderately whether once or twice a day" (Celsus, 1935, 1.51). Galen returned to an explicitly humoral framework but continued to emphasise balance and moderation, following Hippocrates.

But health, wrote Galen, consisted not only in *eukrasia*, or a balance of the four elements, but also in the balance and functioning of the individual parts of the body, which necessarily differ in each individual and change over time (Galen, 2018, 1.16–1.25). Galen did not himself mention the term non-naturals, which first appeared in early medieval commentaries, but the idea is clearly a Galenic concept (Rather, 1968; Niebyl, 1971).

The long-life tradition from Cornaro to Cheyne

In 1558, the Venetian Alvise (in Italian, Luigi or Ludovico) Cornaro, born sometime between 1464 and 1467, published a book that described a minimalist regimen that many would have considered close to asceticism as the key to a long and active life. His little book has never been out of print for 450 years, and has been much imitated and commented upon. Cornaro's life before he wrote *Trattato della vita sobria* followed a familiar redemptive arc. Born with a weak constitution ("having a most cold & moist stomack"), he further damaged his health as a young man by leading a "disorderly" life. In his 40s, physicians told him his only help was to lead "a sober and orderly life" (Cornaro, 1634, pp. 3–4). "I understood," he wrote at the age of 83, "that the food I was to use, was such as belonged to sickly constitution, and that in a small quantitie" (Cornaro, 1634, p. 6). This rather vague category of "sickly constitution" could include a broad expanse of population at any given time, and Cornaro believed his general recommendations applied to just about anyone. His concern was much more with quantity than with specific kinds of food. By trial and error, he discovered that "strong and very cool" wines, fruit, raw lettuce, fish, pork, sausages, beans, cake, and piecrust did not agree with him, and therefore he stopped eating these things. But otherwise he did not specify in this treatise particular foods to eat or to avoid: "No man is forbidden to eat fruit or fish, which I eat not." Rather, he argued, one should never leave the table full, "So that he which is offended with no kinde of meat and drink, hath the *quantitie*, and not the *qualitie* for his rule, which is very easie to be observed" (Cornaro, 1634, p. 33). Cornaro paid close attention to quantity, even weighing his portions, so that his entire day's ration of food was 12 ounces and of drink 14. Varying this ration even slightly had calamitous consequences (Cornaro, 1634, pp. 19–20).

Cornaro therefore did not entirely advocate the "convalescent cookery" that Ken Albala has recently described, and which many early modern physicians declared suitable for "those deemed rather weak, recovering from illness or thought to have impaired digestive systems on account of age or constitution"(2012, p. 323). This cuisine consisted of food thought to be both nourishing and easily digested, with an emphasis on broths and essences and foods of a soft and even mushy texture. For instance, a chicken might be slowly roasted, and then the meat pounded in a mortar, extracting the juices, which would be drunk. Broths would be mixed with eggs and bread crumbs to make a panada. In general, light coloured foods such as chicken or milk were deemed more

suitable than dark coloured foods (Albala, 2012). In an addendum to his treatise, Cornaro gave further details about his diet, conforming more closely to the model that Albala describes. Cornaro ate "bread soup" or broth with an egg to begin his meal – that is, a panada. He seems to have avoided vegetables and fruit, and for meat ate poultry, veal, kid, or mutton, or various kinds of white fish (contradicting his earlier statement that he avoided fish). He drank only "young wine," avoiding aged vintages (Cornaro, 1903, p. 87). This image (Figure 5.1) from the early nineteenth century shows that the "invalid diet" changed little from Cornaro's time.

Although Cornaro's recommendations are light on dietary specifics, one word often appears: "orderly." The essence of temperance consisted of an orderly life of regular habits, a cheerful disposition, learned conversation (or failing that, a good book), writing and regular exercise. He built his own houses in Padua to be warm in winter and cool in summer, and to contain gardens and fountains, themselves also orderly. He travelled often to visit friends, proud

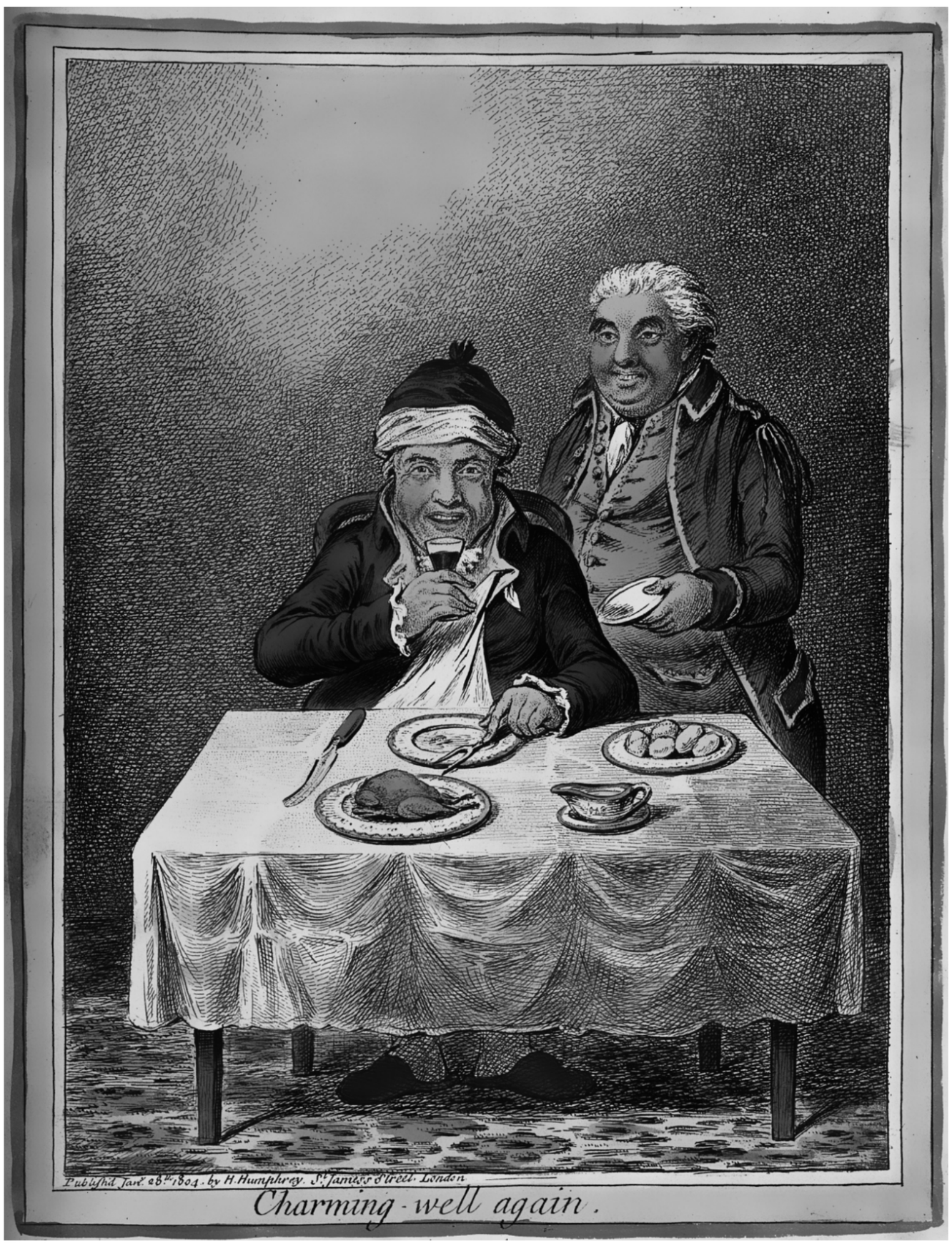


Figure 5.1 A Convalescing Man Happily Eating a Meal, Assisted by His Grinning Servant. Coloured etching by J. Sneyd, 1804, after J. Gillray. Courtesy of the Wellcome Collection.

of his ability to ride a horse even at an advanced age. Such an orderly life, he wrote, "is so profitable, so virtuous, so decent, and so holy, it is worthy by all means to be embraced" (Cornaro, 1634, p. 32). Cornaro expressed few overtly religious sentiments except for a few pro forma references to Providence, and apart from his diet, his life was hardly ascetic. But his example held great appeal to those whose religious asceticism proved to have the extra benefit of a longer life.

The Flemish Jesuit Lenaert Leys, better known by his Latinised name Leonard Lessius (1554–1623), is known to scholars for his work on economics and money lending. Late in life, he translated Cornaro's work into Latin and added his own commentary, titled *Hygiasticon*. The two works were often published together, as in the 1634 English translation by the poet and Anglican clergyman George Herbert. Citing Augustine, Thomas Aquinas, and early fathers of the Church, Lessius bridged the gap between medically inspired regimens such as that of Cornaro and the religious regimens of monastic orders (Turner, 1982). Pachomius, the fourth-century founder of communal monasticism, advised an abstemious diet for monks but also served meat, which the monks could choose to eat or not. The path of "greater vertue," said Lessius, would be to deny oneself meat (1634, pp. 26–28).

Lessius outlined seven rules for "finding out of the right Measure" of food for each individual. The rules ran from the general (if your mind is not clear after eating, eat less) to the particular (12–14 ounces of solid food per day is enough for nearly everyone). He advised easing gradually into an ordered life from a disordered one, and avoiding the temptations of banquets. Food should be prepared plainly, with no spices to pique the appetite. Although, like Cornaro, Lessius said that each person should choose foods according to his own disposition, he recommended panada (bread soup with an egg) as the best food, recalling, like Cornaro, the convalescent diet (1634, pp. 30–75).

In good Scholastic fashion, Lessius added a section on objections and queries to his treatise, in which he cited mainly medical rather than ecclesiastical sources. Unlike Cornaro, who believed that a proper regimen would eliminate the need for medical intervention, Lessius recommended a twice-yearly purging to rid the body of "evil humours," from the bowels, liver, and veins: employing, in other words, cathartics, emetics, and bleeding (1634, pp. 94–96). Lessius added a number of examples of "Holy men in the Deserts and Monasteries of old [who] lived very long, albeit they led most strict lives." So, he claimed, St. Anthony lived to 105, James the Hermit to 104, Simeon Stylites to 109. "There are also Monasteries of women," he added, "in which upon a most spare diet they live to 80 or 90 years." Even non-Christians could experience long lives by following ascetic regimens. There were, however, exceptions: "Homicides and Blasphemers" would die by divine vengeance no matter how little they ate, and those "who are studiously addicted to Lust, cannot be long-lived" because lust "overthrows Nature" (Lessius, 1634, pp. 120–131). Lessius did not address gluttony until the very end of his commentary. Temperance, by clearing the mind and dampening lust, would lead to

piety, while gluttony and a disordered life led to "an innumerable companie of mischiefs" (Lessius, 1634, p. 203). Lessius did not address accusations of gluttony among churchmen, confining his examples largely to long-dead saints and hermits.

Did Cornaro and Lessius recommend moderation, or did they go beyond that? While Lessius praised fasting, he did not recommend it as a regular regimen. Cornaro claimed his diet – estimated to contain about 1,000 calories a day – was more than sufficient, and Lessius asserted that one would not be hungry on such a regimen (Skenazi, 2013, p. 38). Both closely tied their recommendations to current medical theory, particularly with regard to the ageing process. Galen had equated health with a balance of the four humours. While the humours were internal to the body, the use or misuse of the so-called "non-naturals" determined their balance (Rather, 1968; Niebyl, 1971). Age was an additional and critical variable whose impact on the humours necessitated adjustments in the non-naturals, particularly with regard to food and drink.

Galen described the effects of age in terms of a metaphor that Hippocrates, Aristotle, and Cicero had employed, likening life to a lamp that used up its fuel over time. When the light and heat were spent, the lamp went out: the subject died. But either surfeit or deprivation could lead to the same effects: too much fuel – food and drink – would drown the lamp and cause it to go out, while using up the fuel too rapidly would also extinguish the light. Continuing the lamp metaphor, Hippocrates and Galen argued that the human body naturally grew colder with age, so that it required less "fuel" over time. Vital heat, in comparison to the drying heat of fevers, was moist; thus its decrease over time was also a drying process. Cornaro and Lessius both referred to the lamp metaphor (Niebyl, 1971a). What would be considered a moderate diet and therefore an orderly life changed over course of the lifespan, as did the composition of that diet, tending towards warm, moist foods: thus the restriction on fruit, which was considered cold in the humoral scheme. Cornaro implied that towards the end of life one might eat next to nothing, and this too would be in keeping with the natural order of things (1634, p. 45).

The Jesuit Lessius made frequent reference to monastic rule as the basis for his dietary recommendations, but he made little reference to specific religious doctrines. While he certainly believed that gluttony was a sin, he did not spell it out. The English revolutionaries of the mid-seventeenth century, however, saw everything through the lens of radical religion, including diet. Thomas Tryon (1634–1703) was one of a number of religiously motivated dietary reformers in the period following the English Civil Wars of the 1640s. Coming to maturity in the early 1650s, Tryon retained the radical ideas of that era even when many of his contemporaries abandoned them for the worldly pleasures of the Restoration. Apprenticed to an Anabaptist hatter, he took advantage of the outpouring of vernacular literature in this period, studying theology, astrology, alchemy, and medicine. He adopted the ideas of the German mystic Jacob Boehme (1575–1624), who rejected formal religion in favour of the individual

illumination of an "inner light" of divine wisdom. According to Tryon, "The voice of Wisdom … called upon me for separation and self-denial" and led him to drink only water and eat only bread and fruit. The voice later relented and allowed Tryon to eat butter and cheese as well (Tryon, 1705, p. 27).

Tryon pursued his career as a hatter while remaining true to his dietary vows, although his wife refused to follow his example. In the early 1680s, the inner voice urged him to write, and for the next two decades he poured out texts on health and the virtues of a frugal (often vegetarian) diet, as well as on politics, slavery, brewing, and the interpretation of dreams. His 1683 *The Way to Health, Long Life, and Happiness, Or, A Discourse of Temperance* covered theology, disease, childrearing, and the dangers of urban life, as well as food and diet, summarizing some earlier works and serving as a source for later compilations. Compared to the concise and simple text of Cornaro, Tryon's is lengthy and repetitive, directed not to an audience of wealthy Renaissance Venetians but to the literate and rising tradesmen and craftsmen of Restoration England who would employ such a work as a general book of reference for living a good life. Tryon was neither very poor nor very wealthy; his portrait in his later works shows a prosperous bourgeois merchant in a full-bottomed wig. He did not endeavour to reach the upper classes but hoped his work would inspire healthy living and charity among the pious middling sort and also influence the working poor.

In keeping with his didactic purpose, Tryon detailed the theories behind his recommendations, which consisted of a jumble of chymical and humoral medicine, a strong dose of non-conforming Protestant Christianity, and much use of italic font: maintenance of the body, he asserted, was both a physical and spiritual responsibility. Temperance, a "divine Gift," was the means to successful maintenance. Tryon too employed the metaphor of the lamp, comparing on overfed body to a "*Lamp* ready to be extinguisht by superfluity of *Oyl*" (1683, pp. 43, 47–48).

Temperance was frugal, healthy, and spiritual. Longer life was an additional benefit: "most that abandon themselves up to *Gluttony* and *Epicurism* seldom attain to *old Age*, or if by means of an extraordinary tough Constitution they do rub out, 'tis with Tortures and Misery, their Bodies being as full of Diseases as an *Hospital*." Tryon recognised, however, that there were degrees of temperance, and not all would wish to follow his path of bread, cheese, water, and "herbs." Despite his advocacy of vegetarianism in this and other works, *The Way to Health* included substantial sections on the raising of food animals and the preparation of meat. He preferred beef, veal, mutton, and lamb over pork. Fowl were also acceptable, although Tryon much preferred wild fowl to the domesticated kinds. He recommended boiling or roasting as the best methods of preparation to preserve the "Spirits and Life" of meat (Tryon, 1683, pp. 49, 103).

Tryon maintained that those who did not eat meat, however, could have a varied and satisfying diet. He outlined a "Bill of Fare" in his 1691 *Wisdom's Dictates* that included eggs, cheese, milk, and all sorts of vegetables, seasoned

with butter, herbs, and salt and eaten with beer, cider, or "good Canary wine" (Tryon, 1691, p. 152). The soothing and cooling qualities of such foods would have a calming effect on even the most choleric temperament, reducing violent behaviour. Tryon believed that meat retained the violence of animal slaughter, and therefore was better avoided; he attributed the violence of the aristocracy to their meat-heavy diet and their penchant for hunting. Tryon recognised that while an ascetic diet such as one he had earlier followed might be spiritually and physically superior, most people would not be able to follow it. But a simple diet of local and fresh foods – he referred to them as "Clean Foods" – eaten in moderation, could be followed by anyone, rich or poor (Tryon, 1691, p. 101). Tryon's ideas have resonated with dietary reformers ever since; the recent emphasis on "clean eating" is only the latest variation on a theme (Wilson, 2017). While Tryon believed that distilled spirits were purely evil (especially for women), a pint of beer or ale at a meal, or half a pint of wine, was quite acceptable.

Like Tryon, the Scottish physician George Cheyne – whose garrulousness surpassed even Tryon's – railed against luxury and gluttony. In his 1720 *Essay on Gout* he identified his upper-class patients in the fashionable spa town of Bath as "the Rich, the Lazy, the Voluptuous." "TEMPERANCE only," he thundered, "Divine, Innocent, Indolent and Joyous Temperance can Cure or effectively Relieve the Gout" (1720, pp. 96–98). Unlike Tryon, Cheyne was a member of the consuming classes, and he struggled against the temptations of the table for much of his life. Never thin, his weight fluctuated between the merely hefty and the shockingly obese, reaching as much as 32 stone, or 448 pounds. While diet to Cheyne was primarily a medical problem, in his personal struggles it was also fraught with moral and religious significance, as he suggested in his most popular book, the *Essay of Health and Long Life* (1724). Following the genre established by Cornaro, the *Essay of Health and Long Life* reached nine editions in Cheyne's lifetime and was translated into French, Dutch, and German, as well as Latin. He organised the book around the six non-naturals, but devoted nearly half the text to diet and evacuations. Reflecting his medical practice in Bath, his "hyppish" patients suffered often from headache, stomach ache, and "colick," the effects of "Repletion, or living too fully"; from drinking too much wine, or worse "Punch"; from abusing coffee, tea, chocolate, and tobacco. Their abuse of their bodies was a crime against God as well as against nature, a physical and moral failing (Cheyne, 1724; Guerrini, 2000).

Cheyne borrowed his dietary advice from Cornaro, Lessius, and Tryon, interpreting it in the light of the latest Newtonian science of attracting particles and vascular hydraulics, but retaining Galenic ideas of temperaments and humoral balance. He drew heavily upon his own experiences. As early as 1705, when he was in his early 30s, his assiduous attention to coffee houses and taverns in London in the interests of building up a medical practice had led to a physical and emotional collapse. Overweight and depressed, he tried a number of cures, including taking the waters at Bath. There in 1707 he heard of a Dr.

Taylor of Croydon, who advised a diet of milk and seeds for a variety of nervous and bodily ailments. Cheyne visited Taylor and adopted his diet, which he found very effective, as long as he followed it (Cheyne, 1733a; Guerrini, 1995).

Cheyne's *Essay on Gout* advised against an entirely vegetarian diet as too weakening, recommending instead "*Cornaro*'s method" which, he said, included "drinking generous, unmix'd Wines" although in small quantities (1720, p. 15). In the *Essay of Health and Long Life*, he again advised a diet of white meats and vegetables, admitting that England was a meat-eating country and a completely vegetarian diet would be difficult to sustain (Cheyne, 1724). Moreover, each person had an individual temperament that made generalisation difficult. According to his mechanistic-Newtonian theory, the most digestible foods were composed of smaller particles with, therefore, less internal cohesion, since cohesion was proportionate to mass. Cheyne claimed in addition that young fruits and vegetables and those that appeared earliest in the spring were most easily digested, "because they have less of the solar Fire in them." Similarly, young animals and those of lighter flesh had smaller, more digestible particles than larger, redder-fleshed animals whose juices also contained more salt and fat. Fruits such as grapes that ripened long on the vine also imbibed more solar heat, as did larger vegetables and animals. His hierarchy of foods went thus:

> Other things being equal, the proper Food appointed for *Animals* by Nature, is easier digested than the *Animals* themselves; those *Animals* that live on *Vegetables*, than those that live on *Animals*; those that live on *Vegetables* or *Animals*, that soonest come to *Maturity*, than those that live on such that are longer a ripening.
>
> (Cheyne, 1724, p. 24)

Thus, he valourised milk, eggs, the light meat of fowl, and grass-fed rather than "*stall-fed*" beef and mutton. Fish and other animals from the sea were generally not desirable, because they were carnivores.

He recommended avoiding foods with "*strong, poignant, aromatick*, and hot" tastes – either naturally occurring or as a result of preparation – because their noxious salts excessively stimulated the appetite. Elaborate modes of cookery were "the Inventions of *Luxury*, to force an unnatural Appetite." Thus far he closely followed Cornaro and his successors, although with greater scientific justification. He repeated Lessius's list of long-lived early desert saints, ending his list with Cornaro himself (Cheyne, 1724, pp. 26, 29–31). Cheyne's recommendations as to quantity of food also came close to Cornaro's: 8 ounces of meat, 12 of bread and vegetables, and a pint of wine in 24 hours, preferably lighter and younger vintages, along with water. But sedentary people might need less food; and for them Cheyne recommended regular purging – not, like Lessius, once a season, but once a week – as a supplement or even a substitute for a more moderate diet. He quoted Francis Bacon, although he did

not specify the work (translating him from the Latin, "Nihil magis conducit ad Sanitatem & Longaevitatem quam crebrae & domesticae purgationes"): "Nothing contributes more to Health and Long Life, than frequent Family Purges" (Cheyne, 1724, pp. 34, 36–38).

Moderation was the key, although it continued to be difficult to define. The rules of health were "self-evident," given by God. Cheyne sounded very much like the radical Tryon when he wrote, "To die Martyrs to our Luxury and Wantonness, is … beneath the Dignity of human Nature, and contrary to the Homage we owe to the Author of our being" (1724, p. 4). But as both he and Tryon hinted, by the end of the seventeenth century, new foreign foods and drinks made following an abstemious diet even more difficult.

"Rich soop, high sauces," and the curse of empire

While Cornaro, Lessius, and Tryon pointed to alcohol and excess as the greatest threat to a sober, ordered life, by Cheyne's time many other threats had appeared. Cornaro and Lessius would have been familiar with the highly spiced haute cuisine of their day. Warm aromatic spices such as cinnamon, allspice, cloves, and mace, along with a golden colour and soft texture, were the hallmarks of late Medieval and Renaissance cuisine in Western Europe. Sugar, a luxury item, often appeared in main courses as a garnish; saffron or turmeric gave the desired golden colour (Peterson, 1994; Laudan, 2013, pp. 171–186). Such spices were the result of a global trade that dated back to Roman times, and had accelerated with the voyages of discovery of the fifteenth and sixteenth centuries. As Rachel Laudan and other historians have documented, this cuisine began to disappear in the mid-seventeenth century, first at the French court and then across aristocratic Europe, as new medical theories and new tastes introduced a cuisine based on roasted meats, distinct textures, and acid-based sauces (Peterson, 1994; Laudan, 1999; Laudan, 2013, pp. 211–225). Imitation of the sweet and sour-salty condiments of the ancients formed one motivation for this change, but Laudan argues that the dominance of Paracelsian physicians at the French court powerfully influenced royal and aristocratic diets with their new chymical theories of digestion and metabolism (1999).

In the late seventeenth century, political, social, and scientific forces merged to launch a battle over the composition of the English table. The new French cuisine described by Pierre De La Varenne in *Le cuisinier françois* (1651, translated into English as *The French Cook* two years later) undermined traditional cooking techniques and tastes among the aristocracy away from highly spiced cuisines and with more attention to vegetables. At the same time, radical vegetarians in the 1650s made arguments to the working poor that focused on health and the social order that Tryon repeated to the emerging middle classes in the 1680s. Cheyne in turn borrowed from these recommendations in the 1720s in the *Essay on Gout* and the *Essay of Health and Long Life*, directed towards the upper classes who visited Bath for their health. Diet was also at

the centre of concurrent debates between Galenic theory and various chymical notions of the body, which Cheyne further complicated with Newtonian concepts of attraction.

This concern with health merged in England with a kind of culinary nationalism. As Britain became an imperial nation in the seventeenth century, exotic foods entered the diet of its people. Turkey quickly became popular, while vegetables such as potatoes and tomatoes took longer. The physician Martin Lister claimed in 1709 that the British stomach, like the imperial Roman one, had been corrupted with the spoils of the world (Lister, 1709; Guerrini, 2012). A decade earlier, the aristocratic English natural philosopher John Evelyn argued in favour of plain local foods in his *Acetaria, or, A Discourse of Sallets* (1699). Like Tryon, Evelyn believed that "made Dishes and exotic Sauces; which a wanton and expensive Luxury has introduced," were both morally and physically corrupting (1699, p. 138). The simple diet and outdoor work of the yeoman farmer is his, and Tryon's, ideal: the early Roman republic of Cincinnatus and Cato the elder. Unlike Evelyn, Lister did not advocate a return to some pastoral past, but suggested imperial solutions to imperial ills; his comments prefaced a new edition of the Roman cookbook attributed to Apicius, a gourmand of the first century (Grainger, 2007; Guerrini, 2012).

Tryon's audiences would not have had the culinary skills or the wherewithal to participate in the old highly spiced cuisine, nor in the new French style of cooking, nor in some variant on the Roman diet. Like Lessius earlier in the century, Tryon broadly condemned foreign foods and excessive spices, "a thousand Kickshaws enricht with the *East* and *West-Indies* Ingredients." "Kickshaw," a corruption of the French "quelque chose," signified a "foreign-made" (specifically French) dish, particularly one that mixed unfamiliar ingredients. While English cookery books by aristocratic chefs included such dishes – what Cheyne scornfully called "rich *Soops* and high *Sauces*" – to Tryon they were prime examples of culinary excess (Cheyne, 1724, pp. 28–29; Rabisha, 1661, pp. 180ff.; Mennell, 1996, p. 72; May, 1660, p. 431). He recommended a more abstemious version of what most people already ate: bread, cheese, pulses, and herbs washed down with ale or beer. In good economic times, all except the very poorest in England would also have regularly eaten meat, particularly beef (Drummond and Wilbraham, 1957, pp. 100–103). However, by the time Tryon began writing his treatises in the 1680s, new foods had begun to enter the diet of the middling classes, and his emphasis on local food also had a political motivation.

Tryon based his culinary nationalism on a Galenic theory of "complexions": sanguine, choleric, phlegmatic, and melancholy. But these, he said, proceeded from four "qualities" which were distinctly chymical: sweet, sour, bitter, and "astringent or saltish" (Tryon, 1683, pp. 1–14; Guerrini, 2012). He singled out "Sugar, Spice and *Spanish* Fruits" as rich and potentially harmful foods (Tryon, 1683, p. 301). Sugar became more widely available in Europe in the fourteenth century, but it was a rare delicacy in earlier times, when it had to be imported to Europe from India. The growth of plantation agriculture in the West Indies

in the sixteenth century made sugar more widespread in Europe, and also made it an anchor of the triangular trade between Africa, the Caribbean, and Europe in slaves, sugar, and rum (Mintz, 1986; Peterson, 1994, pp. 3–5; Laudan, 2013, pp. 113–114). Neither Cornaro nor Lessius mentioned sugar, but Tryon commented in 1683 that sugar had become "so *Cheap,* that it is scarcely worth the Merchants while to bring [it] over; for where there was one pound of *Sugar* spent forty or fifty Years ago, now there is a Thousand" (1683, p. 220). Too much sugar, he said, overheated the body, and therefore was not advised for people of choleric complexion; but Tryon did not totally abandon its use for others (1691, p. 13). Sugar had long been an ingredient in medicines as well as in foods; its "balsamick" or soothing effects could tone down a bitter innate quality. It was an essential ingredient in the "possets" or "decoctions" beloved of many writers on health, which consisted of hot milk or water in which herbs were steeped. This was then mixed with ale, beer, or wine, and sweetened with sugar. The sugar contributed to the soothing quality of the drink (Tryon, 1683, pp. 546, 556–558). But sugar, along with "Spanish" fruits such as oranges and lemons, was also an ingredient in the much-maligned but very popular punch, which included brandy or rum as its basis. By the late seventeenth century, sugar also came into use to counteract the bitterness of coffee (Cheyne, 1724, pp. 55–58; Mintz, 1986, pp. 108–110; Harvey, 2012).

Coffee had not yet reached Europe at the time Cornaro and Lessius wrote. Flemish botanist Charles de l'Écluse described the coffee plant in 1575, and in 1582 German physician Leonhard Rauwolf, resident in Ottoman Aleppo, described the ink-black drink of the Turks, which was, he said, good for stomach ailments. Venetian trade with the Ottoman Empire brought coffee to Venice in the early seventeenth century, and the first European coffee house opened in Venice in 1645. In London, Pasqua Rosée, a Sicilian Greek, opened the city's first coffee house in 1652 (Cowan, 2005, p. 94). He issued a broadside that extolled its medicinal uses, claiming that its quality was cold and dry, and that it was efficacious not only for stomach ailments but also for "*Dropsy*, *Gout*, and *Scurvy*," and also "will prevent *Drowsiness*" (Rosee, 1652; Cowan, 2005, p. 49). Hundreds of coffee houses had opened across Europe, in large cities and smaller towns, by 1680. As recent studies have shown, they were open to all classes and even to women, and because it was not intoxicating, coffee was considered a respectable beverage, unlike alcohol (Pincus, 1995; Cowan, 2005).

Despite coffee's popularity, not least among tradesmen, Tryon addressed it only briefly, in his 1691 book of aphorisms, *Wisdom's Dictates*. His comments showed his familiarity with coffee and also tea, as well as a good understanding of the nature of addiction:

> Whatsoever a Man gives himself unto, that he becomes strong in, be it either good or evil; as for example, if it be to drink more than need and Nature requires, he will in a little time come both to expect and need it; the like, if it be Drink that is improper, as Brandy, Wine, or the like; nay,

> if it be Coffee or Tea, if a Man be not wary, the use of it shall enslave him, so that he shall not know how to be without, and from drinking it moderately, he shall by degrees, and as it were insensibly, slip into excess.
> (Tryon, 1691, p. 128)

However, Tryon did not otherwise speak about coffee or tea or chocolate, the new triumvirate of stimulating beverages, or "soft drugs," which stimulated without stupefying. Tobacco was a fourth soft drug, usually smoked rather than employed in infusions (Cowan, 2005, p. 7; Smail, 2008, pp. 179–81). Later in his life, Cheyne referred to coffee, tea, chocolate, and snuff as "Pop-gun Artillery," but even small arms could be harmful, and debates concerning the healthfulness of coffee and tea, at least, continue unabated today (1733, pp. 49–51). Samuel Pepys noted in his diary in 1660 that he had sent out for a "Cupp of Thee" for the first time, describing it as "a China drink (of which I never had drank before)" (Pepys, 1993, p. 1.253; Rappaport, 2017, p. 23). Two years earlier, Thomas Garraway had advertised that he served "That Excellent, and by all Physitians approved, China Drink called by the Chineans, Tcha, by other Nations Tay alais [sic] Tee," at his coffeehouse "The Sultaness-head." In a broadside a few years later, he listed even more health-giving properties for tea than Rosée had for coffee (*Gazette*, 1658, p. 801; Garraway ca. 1660). Although tea did not reach its full popularity in Britain until the opening of the Canton trade in 1717, both black and green tea commonly appeared alongside coffee at coffeehouses (Rappaport, 2017, p. 47).

Thirty years after Tryon, Cheyne addressed coffee and tea at length in *Essay of Health and Long Life*. "Since the Time *foreign Luxury* has been brought to it's [sic] Perfection here, there are a kind of Liquors in Use among the better Sort … I mean *Coffee*, *Tea*, and *Chocolate*." Physicians, he said, disagreed as to their healthfulness; "For my own Part, I take all of their *Virtue* to consist in *Custom*, and all their harm in *Excess*." The Turks, he said, drank coffee to excess, and even combined it with taking opium; it was not surprising that they became "*Stupid, Feeble,* and *Paralitick*" as a result, not unlike those who overindulged in alcoholic spirits. But "a Dish or two of *Coffee*, with a little *Milk* to soften it" was excellent in damp weather or to those of a phlegmatic disposition, although not to those of drier constitutions. Tea, on the other hand, especially green tea (which fulfilled Cheyne's requirements of being young and fresh), was excellent in promoting good digestion. He recommended it as an alternative to alcoholic drinks in the *Essay on Gout*. Unlike some contemporaries, he did not agree that consumption of "these *foreign Infusions*" had led to greater frequency of nervous disorders in his age: as he later detailed in *The English Malady*, the causes of such ailments lay much deeper. Unlike the Turks, those who had long drunk tea (Cheyne did not mention the Chinese by name) experienced no ill effects (Cheyne, 1720, p.17; Cheyne, 1724, pp. 60–62).

Chocolate had entered England via Spain. Although, as Sophie and Michael Coe have shown, chocolate was available in edible form in the seventeenth century, it was mostly served as a drink alongside coffee and tea in coffeehouses.

Pepys drank chocolate at home as well as at coffeehouses in the 1660s and 1670s (Coe and Coe, 2007, pp. 167–168). In his 1662 book *The Indian Nectar*, physician Henry Stubbe attempted to relay all that was known about chocolate, from its supposedly aphrodisiac qualities to its medicinal uses to how best to prepare it. He gave several recipes for the preparation of the drink, which might include chilli peppers, vanilla, cinnamon and other spices, aniseed, various nuts, and even ground maize. Sugar was always added; one recipe called for 12 pounds of ground cacao to 4 pounds of sugar. With such ingredients, it is not surprising that chocolate was considered a food. Stubbe also mixed it with milk and an egg, sometimes even with wine, to create a kind of chocolate posset (1662, pp. 160–162).

While physicians agreed that it was good for the stomach and easy to digest, there was considerable disagreement as to chocolate's specific qualities according to Galenic classifications. The sixteenth-century Spanish physician Francisco Hernández, who recounted the Aztec uses of chocolate in the 1570s, claimed it was cold and moist, while others believed it to be warm. Stubbe opined that its essential nature was cold, but it was warmed by the spices mixed with it. All agreed that it was nutritious (Stubbe, 1662, p. 79). Stubbe drank chocolate frequently, and found no ill effects; unlike coffee, it did not keep him awake at night. He added a lengthy section about chocolate's reputation as an aphrodisiac and concluded that this was probably true (Stubbe, 1662, p. 66). Cheyne had a much lower opinion of it: "Some say, *Chocolate* gives them an Appetite …But I am of opinion, tis a *false* and *hysterical Appetite*," comparing its effects to "sharp Wines" (1724, p. 65). He only recommended it to those of stout constitutions.

How much is too much? Quantifying moderation

In 1614, the Venetian physician Santorio Santorio (1561–1636) published his book *Ars de medica statica*, based on 30 years of research with himself as the subject. Drawing on Galenic ideas of balance, Santorio believed that health consisted of a balance between ingestion and excretion. Excretion included what he called "insensible perspiration" through the skin. Spending most of his days on a self-designed scale, Santorio measured his intake of food and drink and what he excreted, thereby also measuring insensible perspiration. Organised around the six non-naturals, *Ars de medicina statica* concluded that the cause of most illness was obstructed perspiration, and that closely monitoring the amount of food ingested would lead to health. The ideal quantity of perspiration was 22 ounces a day; therefore, intake should be monitored to produce this quantity. Santorio's scale was a chair balanced on a beam. The chair could be adjusted so that when the proper weight was reached over the course of a meal, the chair would drop, marking the end of the meal (Gentilcore, 2016, p. 334; Dacome, 2001).

Newtonian physicians such as James Keill (1673–1719) and Bryan Robinson (1680–1754) found that Santorio's quantitative take on diet fit well with their

concept of the body as a hydraulic machine, and obsessively spent years monitoring their weight and diet with Santorio's scale (Dacome, 2001). Although the Newtonian Cheyne endorsed the notion of insensible perspiration, he did not attempt to follow Santorio's methods, nor did he recommend them, preferring inner transformation to mechanical assistance as the way to true health.

Santorio's chair provided one possible means of quantifying moderation. Another means, followed by Cornaro and Cheyne, was, as we have seen, to specify the exact quantities of food in an ideal diet. But the supposed precision of these quantities was in fact quite deceptive. For example, in the seventeenth century and into the eighteenth century, there was no Europe-wide standard of weights, and measures of volume, including the sizes of bottles, varied widely. Moreover, we know remarkably little about the specific foods themselves, and how their effects might have varied: how strong was a cup of coffee, and what was the difference between "Canary wine" and claret?

Before European weights and measures were standardised during the French Revolution into grams, litres, and metres, they varied widely from place to place. Weights and measures were substantially different, for example, in England and Scotland, and in France they even varied from town to town. A pound could be 12 ounces or 16, or something in between, and could vary even within those parameters. Stubbe, in describing the sale of cacao, confusingly wrote, "the best *Chocolata,* call'd *Chocolata-Royal,* will cost *six shillings six pence* each *pound*, weighing about thirteen ounces, or somewhat more; the *ordinary Chocolata*, weighing about fifteen ounces each pound, will cost three shillings and eight pence" (1662, Preface). The pound here seems to be a measure of volume rather than weight. Although the modern stone in Britain is 14 pounds, in earlier times it varied from 5 to 40 pounds, depending in part on the commodity being weighed (Zupko, 1985).

According to historian Ronald Zupko, the pint for wine in Britain was smaller than the pint for beer or ale: 0.473 L for wine, 0.578 L for beer (1990, p. 5). Zupko gives a particularly extreme example of this rampant variation, in the context of the allotment of wine allowed to monks in the fourteenth century: "During the fourteenth century a measure of capacity for wine known as the caritas was standardised at Evesham, Abingdon, and Worcester at ¾ gallon, 1 ½ gallons, and 2 gallons respectively" (1990, p. 19). Although the English made steps towards modernising and standardising their weights and measures in the late seventeenth century, little progress in this area was made until the nineteenth century.

If a bottle of wine did not signify a specific quantity, it is difficult to interpret contemporary accounts of consumption. Surviving wine bottles from the seventeenth and eighteenth centuries, however, seem substantially smaller than modern ones, which generally hold 750 ml and measure about 30 cm (11 inches) in height. This seventeenth-century Delftware wine bottle in contrast is only 18.4 cm (7.25 inches) tall (Figure 5.2). I would estimate that such a bottle held no more than 300 ml, and because of the thickness of the pottery, it probably held even less than that.



Figure 5.2 Tin-glazed earthenware (Delftware), 1651. Courtesy of the Metropolitan Museum of Art.

Cornaro recommended 14 ounces of drink per day, probably wine or wine diluted with water. Assuming modern measures, this is about 0.73 British pints, or a little over 0.4 L. Tryon recommended half a pint of wine or a pint of beer or ale per meal. Cheyne's recommendations, on the other hand, varied widely. In his autobiographical account of his health in *The English Malady*, he described transitioning from a milk and seed diet to a more expansive one by stages. In the first step, he ate "only the wing of a small Chick" and drank one glass of white wine, not red. However, recovering from a fever shortly thereafter, he lived on toast and claret, from half a pint to a pint a day, although this turned out to be less than successful as a regimen. Later he switched from claret to half a pint of port. However, from this point on, as his health improved, "I continued *sober, moderate,* and *plain* in my Diet, and in my greatest Health drank not above a Quart, or three Pints at most, of *Wine* any day," not specifying the variety – that is, a litre or more, which most people would not consider a moderate or sober quantity. Later in the eighteenth century, the Prime Minister William Pitt the Younger (1759–1806) was popularly known as a "three-bottle man," referring to the amount of port he consumed in a single sitting. Even if, as his biographer William Hague claims, a bottle held as little as 375 ml, to be a "three-bottle man" was not a compliment (2004). Pitt's doctor had apparently prescribed port (although in smaller quantities) to aid his digestion (Hague, 2004). Moreover, this wine bottle from 1760, measuring 27.9 cm or 11 inches in height, may shed doubt on Hague's claim (Figure 5.3).

Cheyne finally gave up wine altogether, but not tea or coffee. He and his fellow writers on longevity were often vague about the kinds of wine they drank



Figure 5.3 Glass bottle, probably made in England, 1760. Courtesy of the Metropolitan Museum of Art.

(1733, pp. 340–342). Cornaro most likely drank local wines from the Veneto, both red and white, avoiding, he said, older vintages. "Canary" wine, mentioned by both Tryon and Cheyne, was a sweet white wine from the Canary Islands, near Spain. It was also a "fortified" wine, much like port (a sweet fortified red wine), meaning that the alcohol content was increased with the addition of a distilled spirit such as brandy. By the seventeenth century, "claret" generally designated a red or dark rosé wine from Bordeaux (Robinson and Harding, 2015, pp. 138, 179, 569–574). Therefore, most of the named wines were both sweet and fortified; half a pint of Canary wine would most likely be more than equivalent in alcohol to a pint of most kinds of beer or ale. Most modern beer has between 4% and 6% alcohol by volume, although craft beer can have up to 20%. The figure for wine is generally between 12% and 16%; modern port, in contrast, is around 20% alcohol.

As we have seen, three caffeinated beverages, tea, coffee, and chocolate, entered Europe at around the same time. All were considered to have medicinal qualities, but the social function of caffeine soon overtook medicinal uses, as coffee houses proliferated. In *The Domestick Coffee-Man* (1722), Humphrey Broadbent, a self-proclaimed coffee-man, described the preparation of these

three drinks. Chocolate, commonly taken at breakfast, could be made with water or milk. All versions included sugar. Recipes with water also included a quarter to a half pint of brandy or sherry (the latter producing "wine chocolate") and a small amount of flour. One or two egg yolks per quart of chocolate could also be added. Broadbent claimed that the brandy could not be tasted "yet certainly it very much heightens the fine Relish of the Chocolate when made." He even recommended adding a glass of Canary wine to chocolate made with milk (Broadbent, 1722, pp. 4–5).

Brian Cowan, interpreting Broadbent's instructions for brewing coffee, claimed that the resulting beverage would have been quite weak. Broadbent described the conventional manner of brewing coffee, with 1 ounce of powdered coffee per quart of water, which was then boiled. This method would indeed make weak and sour coffee. But he rejected this method, allowing 2 or more ounces of coffee per quart, and pouring the boiling water over the grounds. Standard modern recipes for brewed coffee call for one scoop (1/3 ounce) of ground coffee per 6-ounce cup. This would amount to 2 ounces of coffee for 36 ounces of water, or very close to Broadbent's recipe. Of course, we have no idea how finely ground Broadbent's coffee was, or how darkly it was roasted. Nonetheless, eighteenth-century coffee may not have been as weak as Cowan believes (2005, p. 80). According to Broadbent, physicians recommended three cups of coffee per day, to be drunk when rising in the morning, at 4 in the afternoon (corresponding to the end of dinner, which was eaten at around 2 pm) and at about 9 at night (corresponding to the end of supper) (1722, pp.11–12). Moreover, medicinal uses of coffee could require a stronger brew, and Broadbent recounted a gentleman who was cured of rheumatism by drinking a quart of coffee at a sitting, brewed with 3 ounces of coffee per quart of water (1722, pp. 10, 12–14).

Broadbent recommended Bohea or black tea for its "balsamick" qualities, which soothed and mollified consumptions and other internal "wastings." But, like Cheyne, he enthusiastically extolled the virtues of green tea and its rejuvenating qualities. It was "one of the Best, Pleasantest, and Safest Herbs that was ever introduced into Food or Medicine" (Broadbent, 1722, p. 16). He gave no instructions as to quantities of tea or water, but advised topping up the pot with hot water as the tea was poured out.

Conclusion

Food and drink were at the centre of the six things non-natural, affecting both mind and body. From the time of Cornaro onwards, management of food and drink was deemed to be essential to healthy ageing. While the authors of early modern longevity literature often stated that their ideal was to follow moderation in all things, and particularly in food and drink, there was no consensus as to what that meant. All agreed that gluttony was bad and distilled spirits were poison, but authors left much room for variation, recognising individual temperaments and local climates. Recommendations ranged from near-asceticism

to vegetarianism to more expansive definitions of "moderation." Most agreed that restricting the quantity of food was essential, but some also specified particular kinds of food that were deemed more healthful, or at least less harmful. Red meat was widely vilified. Even when authors recommended exact quantities, weights and measures varied considerably within early modern Europe and between the seventeenth century and today, so that it is difficult for modern readers to know exactly what "half a pint" meant. We also have little knowledge of the alcoholic content of pre-modern wine or beer, although with increasing interest among home brewers in recreating old recipes, we may soon learn more. Moreover, food and drink held deep symbolic meaning, and national or religious convictions often dictated the boundaries of a good diet.

The introduction of caffeinated beverages in the seventeenth century further complicated the dietary picture. While most physicians agreed that such beverages were healthful and even had medicinal qualities, by the early eighteenth century it was also clear that coffee in particular could be addictive, and that its effects might not be entirely benign. Tea, particularly green tea, came to be seen as more healthful than the others, but Cheyne referred to all of them as "popgun artillery" in comparison to the greater dangers of alcohol. The authors here surveyed would probably have agreed with writer Michael Pollan's advice: "Eat food. Not too much. Mostly plants" (2007). However, a poet in 1810 expressed utter scorn for such concerns:

> Cheer up gluttons, fill your bellies,
> Gourmandize whole pounds of meat,
> Never fiddle o'er your jellies,
> But substantial viands eat.
> Every waistcoat quick unbutton,
> See the enemies advance,
> Charge the turtle, beef and mutton,
> Point the culinary lance.
> Brandish, boys, your knives and forks all,
> As you would in war the spear,
> Bloat your paunches like a foot ball,
> Eat and grease from ear to ear.
> Still let us abhor the motto,
> "*Pauca vesco*"[1] – damping words,
> But good roast beef, piping hot oh!
> Spread in plenty o'er your boards.
> See the sirloin richly smoaking,
> Mark the gravy how it springs,
> Malcontents forbear your croaking,
> Feast like aldermen or kings.
> From the store-house brisk and mellow,
> Quick, the port, and claret bring;
> Through our spacious hall we'll bellow,

"Here's a health to George our king."
Whilst we're gorging without measure,
Hear our greasy chairman cry,
"Eating is *sublimest pleasure*,"
"While we eat – we'll never die."

(Address to Gluttons, 1810)

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Note

1 "eat little."

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Part 3

Exercise and rest



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6 "For it is the debilitating fibres that exercise restores"

Movement, morality and moderation in eighteenth-century medical advice literature

James Kennaway and Rina Knoeff

Introduction

The quotation in our chapter title is taken from the popular medical handbook *Medicina Gymnastica: Or Every Man His Own Physician*, written in 1704 by the English doctor Francis Fuller (1670–1706). It concludes a report on a clergyman of Fuller's acquaintance who for several years had suffered from persistent diarrhoea, which no medicine was able to cure. At the end of his tether, the clergyman, "who had no hope of recovery left," consulted a city doctor and was advised to go riding. In particular, the physician ordered him to "keep to a brisk motion, and gallop as much as he could, enjoying a very strict diet" (Fuller, 1777, pp. 189–192). After following this advice, the cleric recovered completely, confirming Fuller in his belief that exercise was vital for restoring and maintaining the natural vigour of the body by "working and constricting" its fibres (Fuller, 1777, p. 193). Fuller likewise cured himself of his sufferings from hypochondria and indigestion by a similar regime of emetics and exercise on horseback. For him and his contemporaries, it was obvious that "the power of exercise" was central in healthy living, in keeping sound digestion and avoiding a wide variety of chronic distempers such as consumption, dropsy, hypochondria and nervous disorders.

At a fundamental level, dietetic advice on exercise of this kind displays a remarkable degree of continuity from Classical Antiquity to the present day. Few physicians would ever have rejected the idea that moderate physical activity is good for health. However, the long eighteenth century's conception of what counted as exercise and how it affected the body was rather different to that of our own time. For starters, there was little in the way of organised team sport. Although versions of many modern sports have long histories (the first recorded county cricket match in England was as early as 1709), most of the exercise involved was individual – in line with the pre-modern notion that regimen (and thus exercise) was a matter of a person's particular constitution. More significantly, during the eighteenth century, advice on exercise moved away from a stress on balance, "gentle" movements and exercise involved in daily activities towards a focus on principles of stimulation, strength and vigour. Bound up with new physiological thinking on the fibres of the body

and a social critique of idle rich, there was a perceptible shift to praise of more intensive exercise that had long been seen as potentially dangerous, in an emerging discourse of the bourgeois, disciplined, productive, national body (see Vertinsky and Hargreaves, 2007; Markula-Denison and Pringle, 2006; Chapter 7 in this volume).

This chapter also considers the figure of the valetudinarian in eighteenth-century discussions of exercise, raising issues of "passive" exercise and the value of pleasure for people for whom serious exertion was out of the question. Exercise was considered of great use in improving the lives of those suffering from chronic distempers. Indeed, it was generally agreed that weak, old, overweight and disabled bodies – i.e. people who were least likely to enjoy and take part in frequent exercise – were most in need of motion to keep up their strength. The well-known Scottish physician George Cheyne (1672–1743) was typical when he said that he had written his *Treatise on Health and Long Life* for "the sickly and the aged, the studious, and the sedentary, persons of weak nerves, and the gentlemen of the learned professions," and that, "the robust, the luxurious, the pot-companions, the loose, and the abandoned, have here no business" (Cheyne, 1724, p. vi; Kennaway, 2016). Our image of eighteenth-century exercise should thus focus as much on the frail and sickly body as on the ideals of masculine perfection discussed in Chapter 7 by Sanislo.

The topic of exercise related to Enlightenment health advice has hitherto received surprisingly little attention. Important case studies have been published on exercise as recreation with individual sports, with a focus in eighteenth-century Britain (in particular cricket, boxing and horse-racing), but scant attention has been paid to the topic in terms of medicine and health. Instead, scholars have examined the elite culture of sport that emerged from the sixteenth century, which, as James Williams has shown, was highly politicised, with Renaissance Humanist ideas of "keeping the peace" channelling social and political competition into the format of sports and games (Williams, 2008). Historians inspired by Norbert Elias have often placed these changing early modern attitudes to sport in the context of a "process of civilisation" in which sport was essentially about inculcating correct social behaviour among players and in society (Elias and Dunning, 1986). Recently, Rebecca von Mallinckrodt and Angela Schattner have challenged the narrow focus on court society in relation to sport. Rejecting any idea of a strict separation between early modern and modern sports, they argue that before 1700 they were not only characterised by rituals and rules aimed at minimising violence but were also rooted in broader historical and cultural conceptions of body, status, honour, masculinity and the nation (von Mallinckrodt, 2008; von Mallinckrodt and Schattner 2016, see also Collins, 2007 and Thurley, 1991). Important exceptions to the general neglect of exercise in terms of health are Julia Allen's account of Samuel Johnson's sporting activities in relation to eighteenth-century health concerns (Allen, 2012) and the recent work of Sandra Cavallo and Tessa Storey on the sixteenth and early seventeenth centuries. They demonstrate that, while thinking on exercise still reflected aristocratic culture and

notions of the ideal male body, there were significant changes in medical ideas on what constituted healthy exercise (Cavallo and Storey, 2013).

This chapter builds on Allen, Cavallo and Storey's work and focuses on three important aspects of eighteenth-century health literature on exercise. First, it argues that the eighteenth-century model of the fibrous and nervous body enabled a revival of the Classical model of healthy exercise in relation to notions of vigour, bodily heat and the strengthening of organs and limbs. Cavallo and Storey have observed that this connection was all but lost during the sixteenth century as the aim of making the body stronger became secondary to the promotion of exercise as a part of normal daily activities (Cavallo and Storey, 2013, pp. 147–148). However, by the eighteenth century, medical ideas were no longer primarily directed at balancing the humours, but involved arguments about the strengthening of the fibres of the body. In fact, emerging ideas about vital "solids" and fibres were at the root of a new rhetoric in which strong exercise was crucially important in keeping up the body's life, motion and health. Or, in the words of Jerome Gaubius (1705–1780), writer of one of the most influential eighteenth-century pathology textbooks: "the vital powers, therefore, by which the humours are circulated, by the continual action of the muscles, are every-where animated, and constantly increased with new ones" (Gaubius, 1778, p. 173).

The new physiology also provided a basis for focusing on those with weak health – often described as "valetudinarians." Most (chronic) diseases were defined in terms of laxity, the very opposite of strength and vitality. Medical writers identified weakness of fibres as the greatest medical evil: it slowed down circulation, obstructed healthy perspiration, it led to an excessive filling up of tubes and vessels, resulting in obesity, consumption, indigestion and other discomforts. Doctors were, however, optimistic about addressing the issue by means of exercise. As in the above-mentioned example of the clergyman, vigorous exercise would restore debilitating fibres and would greatly improve health. The focus on valetudinarians was often directly linked to a moralising tone and a subtext of social critique. Like eating and drinking, exercise and rest was a non-natural that had obvious links to self-control, sin (especially sloth), luxury and vice. More than ever, medical writers made exercise part of people's individual responsibility. The anonymous writer of *Hippocrates' Treatise on the Preservation of Health* (1776) stated that "every person is to estimate, by the strength or weakness of his constitution, the proportion of exercise fit or necessary for him" (Anon., 1776) – with all the moral implications that had. Not surprisingly, ideas about moderation and temperance, a familiar theme since Antiquity, also changed. Rather than moderating the exertion involved in the exercises themselves, medical writers emphasised regularity and rationing of exercises. Passive exercise, such as riding in carriages and sedan chairs gradually lost popularity in favour of more energetic things like horse riding. And physicians increasingly stressed that getting sweaty and out of breath was not a problem as long as one took proper breaks between exercises. An important concern pivoted on the paradoxical (and from a modern standpoint, very

recognisable) question of how bodies least able to do exercise are most in need of it. In the final part of the chapter, we discuss how passive exercise machines and other tools such as the flesh brush helped in upkeeping a regular exercise regime, in particular for those who were not able to indulge in more vigorous exercise.

Exercise and the body oeconomy: fibres, fluids and nerves

The long eighteenth century conceived of the body as a matter of fibres as much as in terms of the more traditional paradigm of humours and fluids. From the 1750s, self-acting and sensitive fibres were considered the central building blocks of the body, and medicine became primarily concerned with the properties of fibres and the organised networks or systems of individual fibres, tissues and membranes (Cheung, 2010; Berg, 1942; Ishizuka, 2016). Although fibres had been discussed since Antiquity, they gained new importance during this period as the carriers of life and vitality, and exercise was considered "a main spring to the machinery," in the words of the British surgeon Andrew Harper (Harper, 1785, p. 18). Although they were central in early modern medical thinking, fibres have been rather neglected by historians of medicine, perhaps due to a historiographical tendency to overemphasise the importance of the nervous system in the wake of George Rousseau's groundbreaking work on sensibility (Rousseau, 2004; Vila, 1998; Gaukroger, 2010; Riskin, 2002).

During the eighteenth century, medical writers moved away from mainly describing the anatomical function and order of fibres to seeing them in physiological terms as organic systems. This does not mean that mechanism totally disappeared or that we can clearly demarcate mechanism from vitalism. As historians have recently argued, most mechanical theories included vitalist elements and vice versa, vitalism by no means excluded mechanical explanations (e.g. Wolfe, 2008). However, for the purpose of our argument, it is useful to think of eighteenth-century medicine in terms of a broad shift from understanding and describing the fibrous body in terms of "an aggregate of simple, elementary inert particles of various shapes" to including vital principles and understanding "life" as a physical property of the solid parts of the body (Reill, 2005, p. 43). While both models remained *en vogue* and "vitalism" was hotly debated throughout the century, the Boerhaavian discourse of fibres as web-like systems of tissues, tubes and organs moved towards discussions on the role of the living fibre in models of organic order. In general terms, the question of how fibres move changed from a focus on the mechanistic or chemical powers of contractibility, elasticity and irritability to an understanding of fibres as vitalistic "mini machines" (*machinules*) that organise and animate the organic system (Cheung, 2010).

In this context, "organisation" became a keyword in discussions on the body oeconomy across Europe. Rather than presupposing an externally imposed divine order, they considered the animate order as a result of the organisms' own agency (Riskin, 2016, p. 180), related to the potential of fibres to restore themselves. The

French natural philosopher Charles Bonnet (1720–1793) explained the order of organic bodies through the assimilative "reproduction" of the order of a regulating "plan" within a "system" of mini-machines that produce, sustain and repair "tissues." He maintained that these regulated processes are executed by a "secret force" (*force secrète*) that acts like a self-moving flying shuttle which "chases" the nutrition in the meshes (Cheung, 2010, p. 86; see also Riskin, 2016). Other medical writers expressed similar ideas in arguing that the organic fibrous body regulates itself and perpetually renews and restores its (fibrous) parts.

The new emphasis on living fibres (or solids) was followed by a revaluation of exercise as *the* primary means to keep up the strength (and by extension the life) of the fibres. It follows that exercise was not only directed at building up the gross structures of the body, such as the bones and muscles, but also at strengthening the smallest solids and fibres. Cheyne wrote that, "by constant Friction, Irritation and Stimulation," exercise would "allicite Blood and spirits to the Parts most distant from the seat of Heat and Motion, and so to plump up the superficial muscles." Moreover, friction also assisted in stimulating perspiration, which in turn was considered necessary for getting rid of wasteful particles. It assisted "nature to throw off by *Perspiration*, the *Recrements* of the juices which stop the full and free *Circulation*" (Cheyne, 1724, p. 53). In other words, "friction," or frequent massage, out of favour since the sixteenth century (Cavallo and Storey, 2013, pp. 147–148), was firmly back on the eighteenth-century agenda.

Other observers made similar arguments. As the Scottish dietetic writer James Makittrick Adair (1728–1802) put it, "exercise" was "the most certain and permanent corroborant of the solids and nervous fibres" (Makittrick Adair, 1772, p. 66). The famous German physician Christoph Wilhelm Hufeland (1762–1831) argued that, "he who eats without labour will never thrive. If the necessary proportion be not preserved between restoration and self-consumption, it is impossible to retain health, or prolong life" (Hufeland, 1797, p. 2.64). Likewise, John Sinclair argued in his *Code of Health and Longevity*:

> The solids of the body, whatever their form or texture, are incessantly renewed. The whole body is a perpetual secretion, and the bones and their ligaments, the muscles and their tendons, all the finer and all the more flexible parts of the body, are continually renewed. … The health of all the parts, and their soundness of structure, depends on this perpetual absorption, and perpetual renovation; and exercise, by promoting at once absorption and secretion, promotes life, without hurrying it; renovates all the parts, and preserves them apt and fit for every office.
>
> (Sinclair, 1807, p. 512)

It followed that without exercise, the solids were perpetually wasted without being properly restored. The body "becomes shrunk, emaciated stiff and motionless" and would age prematurely. According to Sinclair, ascetics were living proof that even though temperance ensures a long life, a life of

abstinence was harmful for the strength and health of the body (Sinclair, 1807, vol.2, app. IV, p. 85). At the same time, too much food and too little exercise would disturb the processes of digestion and secretion and cause the body to swell. Unsurprisingly, Sinclair was a fervent promoter of vigorous exercise as exemplified by the gymnastic exercises of the Ancients, in particular running, wrestling and boxing. In a letter to Sinclair, the Scottish author of the bestselling *Domestic Medicine* William Buchan (1729–1805) praised the Ancients, stating that Greek statues, which in his view no one had ever rivalled, attested to the fact that constant exercise in the open air restores the body and brings it to the highest pitch of perfection (Buchan in Sinclair, 1807, p. 2.115).

Along with the fibres, the fluids of the body remained a key way of understanding how the body worked. Combining centuries of humoral medicine and early modern iatrochemical and iatromechanical thinking, eighteenth-century physicians conceived of human physiology in terms of vital solids affecting the cohesion and movement of humours or "animal fluids." Models of the impact of exercise on the human body based on ideas of the movements of fluids are clear in many sources from the period. For instance, the *Encyclopédie* focused on the impact of physical activity on the body in these terms. Exercise, it suggested, was good for the "fluidity" and for the "natural warmth," aiding concoction and ensuring the effective excretion of humours.[1] It was because of these effects that exercise was good for digestion (*Encyclopédie*, 1751–1772, p. 6.245). It also followed that exercise was essential for the quantity and quality of blood: "exercise, being in the prime of life, increase the blood enclosed in the sanguinary vessels, its redness, its force, its density, the cohesion of its components, the rigidity of the coagulated serum, its weight and its alkaline principles" (*Encyclopédie*, 1751–1772, p. 14.612).[2] Similarly, the Anglo-Prussian physician Anthony Florian Madinger Willich (d. 1804), in his *Lectures on Diet and Regimen*, emphasised the fluids in his explanation of the benefits of taking exercise. Along with increasing "bodily strength," the "essential advantages of exercise" were related to "the circulation of the blood and all other fluids," meaning that

> the necessary secretions and excretions are duly performed; the whole mass of the blood is cleared and refined, so that it cannot stagnate in the minutest capillary vessels; and if any obstruction should begin to take place, it will thus be effectually removed.
>
> (Willich, 1809, p. 275)

Exercising in cold air was held to have particular health benefits for both the fibres and fluids (see the discussion on skating and cold air in Chapter 2). In his 1795 *Guide to Health*, Joseph Townsend argued that "air baths" contribute significantly to the benefit of exercise, writing that "exercise increases the respiration and intake of oxygen. It quickens the circulation of the blood so that more vital energy is distributed to the organs and limbs" (Townsend, 1795, p. 306). And John Sinclair stated that activity in cold air was good "for promoting

perspiration" which would aid "digestion," arguing winter walks were useful because "when the air is pure and bracing, and the cold excites quickness of motion" (Sinclair, 1807, 1.671). In a letter to a patient from February 1786, the prominent Edinburgh physician William Cullen wrote that

> I shall advise you to pass the summer in the Highlands and there with cold bathing to take a great deal of gentle exercise by walking, riding or going in a carriage as weather, roads or your own feelings may direct. This will I hope restore you entirely.
>
> (Cullen, 1786)

An aspect of Enlightenment physiology in some ways combined thinking on fibres and fluids related to the nervous system. The work of the Swiss physiologist Albrecht von Haller (1708–1777) on the distinction between irritability and sensibility sparked a long-standing debate on the nerves as fibres (Haller, 1752). At the same time, many observers continued to believe in the existence of a "nervous fluid," even while often acknowledging that it must be "subtle" since it could not be observed (Rothschuh, 1960). The English physician Theophilus Lobb (1678–1763) argued that people who "employed in hard labours" or in equivalent forms of "exercise" used up the "nervous fluid" that was secreted into the body, but that those who did "little exercise" and "live a life of ease" were likely to become ill from having an excess of nervous fluid (Lobb, 1771, p. 1.47). Many dietetic writers argued that lack of exercise among the elite was a leading cause of nervous complaints. For instance, William Buchan wrote that,

> Weak nerves are the constant companions of inactivity. Nothing but exercise and open air can brace and strengthen the nerves, or prevent the endless train of diseases which proceed from a relaxed state of these organs. We seldom hear die active or laborious complain of nervous diseases; these are reserved for the sons of ease and affluence. Many have been completely cured of these disorders by being reduced from a state of opulence, to labour for their daily bread. This plainly points cut the sources from whence nervous diseases flow, and the means by which they may be prevented.
>
> (Buchan, 1797, p. 72)

The impact of exercise on the nervous system provided a rationale for its supposed powers on another non-natural – "the passions of the soul," i.e. emotions and mental states. In the dietetic literature of the period as well as in consultations with patients, physicians often stressed the value of physical activity for dealing with nervous "low spirits" and associated psychological problems. For example, the eminent Edinburgh physician Robert Whytt (1714–1766), an influential figure in the medicine of the nerves, wrote that "Exercise is of such use for strengthening the nervous system, that, without its assistance the most

powerful medicines will prove often ineffectual" (Whytt, 1765, p. 355). As the correspondence and literature of the period attest, such ideas were also widespread beyond medical circles. The Scottish biographer James Boswell wrote of the links between mental symptoms and exercise in a 1782 column of his series *The Hypochondriack*. Drawing on Claude Revillon's *Recherches sur la Cause des Affections Hypochondriaques* (1779), he argued that the "hyp" was essentially a physical problem ("merely corporeal") and could therefore be "removed by exercise" (Boswell, 1951, p. 319).

Exertion, morality and moderation

By linking physiology and physical activity to mental and emotional states, the nervous system was a key way in which Enlightenment ideas about exercise were intimately connected to broader concerns about morality, productivity and self-control. Most of these anxieties were related to the theme of temperance and moderation that had dominated thinking on regimen since Classical Antiquity, combined with Christian thinking on sloth as a sin. The influence of religious thinking remained profound and was often explicit. As Anita Guerrini has argued, George Cheyne's dietetic writings had something of the character of Protestant spiritual autobiography (Guerrini, 1999). As a passionate Episcopalian, he included an "Account of the Author" at the end of his influential 1733 *English Malady*, apologising for the "indecent and shocking egotism" of writing about himself. It offered a familiar narrative of struggle, weakness and redemption, particularly in relation to his weight (which at one point reached an enormous 32 stone [448 pounds/203kg]) and the health he enjoyed when he was "lank, fleet and nimble" from riding for "ten, or fifteen miles a day" (Cheyne, 1733, p. 338; Guerrini, 1999). The religious element was also apparent in his advice to others, especially to "the studious and the contemplative, the valetudinary, and those of weak nerves" whom he told to "make exercise a part of their religion" (Cheyne, 1724, p. 98).

However, the meaning of moderation significantly changed over this period. The late eighteenth-century focus on the fibrous body and the self-organising – and essentially hidden – forces of organisms led to a renewed attention on the material body, and consequently to a re-evaluation of health advice regarding exercise. Moderation was still considered an important guiding principle, but it was now embedded in the Enlightenment model of the body oeconomy and moral arguments about how to divide and ration bodily strength over the course of a lifetime. Partly as a result of new thinking in physiology, strong exercise, previously usually condemned as harmful to the body, became gradually accepted as the best way to restore and maintain health and well-being. This had immediate consequences for the question of how much exercise was necessary for elite bodies which were formerly considered too delicate for an active lifestyle. Increasingly, the inactive and unproductive lifestyles of elites were under scrutiny, while simultaneously ideas about self-control changed:

it was no longer necessary to avoid sweating, instead an idealised idea of "the labourer" was brought forward as a model of well-trained perfection.

In reaction to eighteenth-century concerns about luxurious lifestyles and ensuing diseases of prosperity, vigorous exercise was increasingly put forward as a kind of remedy against the ill effects of too much eating and lazing about. In his discussion of exercise, William Buchan baldy stated that idleness equals vice:

> Indolence not only occasions diseases, and renders men useless to society, but promotes all manner of vice. To say a man is idle, is little better than calling him vicious. The mind, if not engaged in some useful pursuit, is constantly in quest of idle pleasures, or impressed with the apprehension of some imaginary evil. From these sources proceed most of the miseries of mankind. Certainly man was never intended to be idle. Inactivity frustrates the very design of his creation; whereas an active life is the best guardian of virtue, and the greatest preservative of health.
>
> (Buchan, 1797, p. 74)

He went further and praised laws that would oblige "every man, of whatever rank, to learn some mechanical employment" to ensure the rich were forced to exercise (Buchan, 1797, p. 74) – a strikingly authoritarian suggestion rather at odds with some facile twenty-first-century assumptions of "liberal Enlightenment values."

It was generally acknowledged that the vice of inactivity leading to weak fibres was at the root of the apparent obesity epidemic. Buchan argued that idleness induced a universal relaxation of the solids, making the body susceptible to fatness. He expressed real loathing of those who "loll all day in easy chairs and sleep all night on beds of down" (Buchan, 1797, p. 71). This is also apparent in the writings of George Cheyne. He argued that "a fat corpulent and flegmatick constitution is always attended with loose, flabby and relaxed fibres by their being dissolved and oversoked [sic] in moisture and humidity" (Cheyne, 1724, p. 97). The weakened fibres led to a languishing of all animal functions, most obviously in the digestive system, so rather than processing food and drink, the fat of the aliments stagnates in the vessels, making them swell, causing corpulence. And as if that were not enough, in the end,

> those who do not accustom themselves to exercise … must in consequence expect that their bodies will shortly become a prey to torturing, nay excruciating pains. What milder effects can proceed from an uninterrupted settlement of a complicated load of gross and increasing humours?
>
> (Anon., 1776, p. 36)

It follows that – perhaps even more than adjustments in food intake – the primary cure for obesity was exercise, which would strengthen the fibres and

restore digestion and evacuation. In particular, pains of the stomach, flatulence and indigestion, all resulting from an inactive lifestyle, were best treated not by medicine but by a vigorous course of exercise (Buchan, 1797, p. 73).

The "idle" sedentary lives of upper-class women were likewise subject to medical criticism from physicians. Early in the eighteenth century, the famous Leiden Professor of medicine Herman Boerhaave (1668–1738) blamed an excessive menstrual flux on idleness and laxity of habit, combined with "the bad custom which obtains among our Dutch women of placing fire-pots under their petticoats and feet" (Boerhaave, 1757, 2, §667; Knoeff, 2002). In contrast, "those who are daily used to hard labour" have a regular cycle with a minimal loss of blood. Likewise, the anonymous author of *Letters to the Ladies, on the Preservation of Health and Beauty* (1770) noted that "ladies" were generally "very defective in the healthy exercise of walking. There are some ladies who pass most part of their time in London, that scarcely walk twenty yards in a stretch, from one end of the year to the other." (Anon., 1770, p. 161). Some more radical observers argued that this was really the fault of social convention and the control of women and not the result of bad character. Nevertheless, they also were often unambiguous in their warnings of the consequences and the tone was increasingly hostile, reflecting a growing emphasis on the duty to be productive. The Bristol physician Thomas Beddoes (1760–1808) saw "the neglect of that exercise, which the human animal was formed for taking" in the "artificial" lifestyles of elite women as a cause of their "indigestion and the common propensity to hysteria" (Beddoes, 1802, p. 2.96). "In London," he wrote, "many women of the higher ranks … take no exercise or air, which they can avoid; but constantly pass from hot rooms to close carriages. By this course, even inattentive observers can perceive how materially they are affected" (Beddoes, 1802, p. 1.81).

Despite all these jeremiads about idleness, medical guidebooks did continue to warn against the perils of excessive exercise, but those warnings seemed to have gradually faded, reflecting new attitudes towards exercise. To twenty-first-century eyes, these warnings can seem very cautious indeed. Today, concerns about people doing too much exercise are generally raised in relation to injuries or really extreme sports such as ultra-marathons, but in the long eighteenth century, it was a medical commonplace that serious illness and even death could result from overdoing it. Herman Boerhaave warned that "cacochymical" people (i.e., those with vitiated fluids) could expect "dropsy, empyema or some other consumptive disorder," if they overdid exercise (Boerhaave, 1757, 5.§767). Willich, in his *Lectures on Diet and Regimen*, counselled that "violent exercise" was "particularly hurtful to persons unaccustomed to it" if they had eaten or drunk too much or were subject to "strong emotions of the mind" (Willich, 1809, p. 276). And *De morbis artificum diatriba* (*Diseases of Workers*) (1700), Bernardino Ramazzini's pioneering work on occupational health, which included a Humanistic discussion of gymnastics in Antiquity, argued that Galen had been right to argue that being an athlete is the ruin of both mind and body (Ramazzini, 1963, p. 321). Running, the centrepiece of

twenty-first-century ideas of exercise, was often frowned upon. Willich wrote that it,

> shakes the body with… violence… heats the head and face, and too much accelerates the circulation of the fluids … If long continued, it is hurtful to every one, particularly to persons unaccustomed to it, to the plethoric, to those subject to hemorrhages, gravelly complaints and frequent nervous head-ach, and to the sedentary, and studious.
>
> (Willich, 1809, p. 281)

Beyond medical circles, these understandings of the dangers of exercise were common. For instance, in August 1729, the English courtier Lady Hervey wrote a letter to Mrs. Howard where she portrayed herself as "your physician," warning "against such violent exercise as you tell me you take, all extreams are I believe equally detrimental to the health of a humane body" (Hervey, 1729). Likewise, in his *Advice to a Young Man upon First Going to Oxford in Ten Letters* (1832), Edward Berens, a Fellow of Oriel College, warned his nephew against the dangers of "any excessive bodily exertion," especially in terms of that Oxbridge speciality, rowing. That sport, he wrote, had led many men to die "at an early age" or left them "with all their powers debilitated, from having overstrained their nerves, and their whole muscular system, in boat-races" (Berens, 1832, p. 87).

These cautious warnings, however, fitted with particular elite concerns that had been widespread since the sixteenth century, but during the eighteenth century they were more and more identified with idleness and sloth. Warnings against vigorous exercise declined as exertion in exercise was increasingly valued as beneficial to health. Particularly important is that medical writers increasingly fused the ideas of "exercise" and "labour" in arguments about the benefits of regular exercise. The *Encyclopédie* (1751–1772) clarified the distinction between "labour" and "exercise" as follows:

> The meaning of exercise in general, however, is restricted to expressing the action of the body to which one gives oneself voluntarily and without an absolute necessity, in order to distinguish it from work, which is most often an action of the body to which one carries oneself with difficulty, which harms health, and accelerates the course of life, by the excess which is often inseparable from it.
>
> (*Encyclopédie*, 1751–1772, p. 6.244)[3]

This definition still fits the sixteenth-century idea that vigorous exercise was only considered suitable for strong and healthy males in their 20s and 30s. All others (including women, children, the aged and weakened) were recommended to pursue their daily activities and avoid sweating and hard breathing. In particular, walking was favoured as the healthy exercise par excellence. In fact, during the seventeenth century, exercise became almost synonymous

with walking. Gentle exercise for genteel bodies became associated with aristocratic culture and significantly differed from exercises considered suitable for the hardened bodies of labourers. Indeed, the division between labour and exercise, most strongly put forward by Girolamo Mercuriale in 1569 in his *De arte gymnastica*, stood for a broader approach to exercise that warned against the dangers of vigorous exercise (Cavallo and Storey, 2013, pp. 148–149).

During the eighteenth century, however, the strong division between exercise and labour was increasingly under attack. Most vocal in his appreciation for the benefits of hard labour was the British physician William Cadogan (1711–1797). In *Dissertation on the Gout*, he suggested that gout and other chronic diseases were basically the patient's own fault: "all that class of complaints which the learned call chronic diseases, we most undoubtedly bring upon ourselves by our indulgences, excesses or mistaken habits of life" (Cadogan, 1771, pp. 1–2). Not surprisingly, Cadogan's book sparked a controversy, not in the least by speaking positively of labour in moral, medical and religious terms. The Bath physician William Falconer (1744–1824) remarked, perhaps not unreasonably, that if Cadogan had worked in the mines and coal pits instead of lounging around Soho, "labor might not have been so sweet" (Falconer, 1771, p. 21), and noted that in his youth Cadogan lived a life of indulgence, which belied the moralising tone of his advice as an old man (Falconer, 1771, pp. 2–3).[4] The judgemental tone of Cadogan's exercise advice and particularly the undermining of the distinction between labour and exercise leading to disappearing boundaries between labouring and bourgeois classes also led some to respond in verse. An anonymous lady called Stella expressed her doubts in her satirical poem *The Doctor Dissected or Willy Cadogan in the Kitchen*:

> Use manual labor, walk many a mile,
> Or pester'd you'll be, – with gout, cholic and bile
> For nature alone by brisk exercise thrives,
> A new lease it will give the most desperate lives.
> Scrub tables, clean pewter, and dry-rub your rooms, –
> He'll furnish with bees-wax, mops, brushes and brooms:
> And rather than not set your blood in a flutter
> I'll venture to promise, to each a clean duster.
> Indiscriminate action, makes shocking confusion,
> But lest you are puzzled to find an allusion;
> Like the sun 'fore the moon, and the moon 'fore the sun,
> Chyle, serum, lymph, blood, – shoul'd in due order run.
>
> (A Lady, 1771, pp. 6–7)

The physician and Tory satirist John Shebbeare (1709–1788) was of the opinion that Cadogan was "equally great in moral as in physical philosophy," but rejected his view that providence dictates that every man should labour for himself. Perhaps, so Shebbeare mused, "Dr. Cadogan might have spoken little more positively than it seems to have been the design of providence." Instead of

turning the societal tables, Shebbeare argued that providence has installed "society" to uphold the "harmony of subordination" (Shebbeare, 1773, pp. 72–73). It followed, in a rather Panglossian manner, that if inactivity is part of "society," it is part of providence as well, and must necessarily be a good thing. Or, as Falconer also remarked, "Why such a variety of things created for our comfort, support, and entertainment, if they are not to be used?" (Falconer, 1771, p. 5).

Shebbeare was as conservative in his medical views as he was in his politics. He firmly held on to early eighteenth-century mechanical views in denying Cadogan's notion that the body needed more than the mechanistic motions of the heart and arteries (i.e. exercise) to keep up its strength.

> In the human body either the powers, contained in the heart and arteries are sufficient to circulate the blood, or they are not. If they are, they can need no assistance of the muscles. If they are not sufficient of themselves, then, when they are unassisted by these muscles, why is not this circulation suspended?
>
> (Shebbeare, 1773, p. 86)

In Shebbeare's view, exercise had nothing to do with health, a conclusion supported by his observation that there were "a greater number of fat people with fresh colour in their cheeks, and more health and wholesomeness than lean." In addition, he had often observed that the drying up of vessels into fibres happens much more often to "those who labour and use abundant exercise" (Shebbeare, 1773, pp. 89–90). Clearly, Cadogan's eulogy of the physical benefits of labour did not meet the approval of all his contemporaries.

However, Cadogan was not the only medical writer to fuse the categories of exercise and labour. One of his critics, John Berkenhout, stated in an open letter that "with regard to activity and temperance you are probably right" and he quoted Gerard van Swieten's story of an unfortunate priest who was abducted by pirates. The priest, being a victim of a "fat living, and violently afflicted with the gout," was "condemned to labour at the oar during two whole years," which entirely cured him of the gout (Berkenhout, 1772, pp. 34–35). Over the years, physicians increasingly valued the health effects of hard work, reflecting perhaps a growing focus on productivity and hostility to the vices of the "idle rich." Simultaneously, physicians' understandings of moderation shifted from the general advice to reduce the efforts of exercise itself to understanding moderation in terms of "regular exercise." Obviously, the latter was strongly associated with the activities involved in daily labour. Thus, whereas before "labour" was unfashionable and only considered suitable for workers, physicians now pointed at the exemplary health and happiness of "those whom poverty obliges to labour for daily bread" (Buchan, 1797, p. 71). The English clergymen Henry Kett, a Fellow of Trinity College, Oxford, included a discussion of the issue of the value of work in the health of labourers in his book *Emily, A Moral Tale, Including Letters from a Father to His Daughter* (1809). Nervous complaints in particular, he suggested, were encouraged by

"indolence" and "lessened … by exertion and exercise." That was why the "lower Orders of the community seldom complain of them, and that they are confined to those who breathe in carpeted and hot rooms, and are moved about in close carriages?" (Kett, 1809, p. 1.291).

The chutzpah of this view of the fortunate poor was given clear expression by the Edinburgh physician James Mackenzie (1680?–1761) in his *History of Health, and the Art of Preserving It*, who suggested that "the poor, if they are virtuous and cleanly, have great advantages over the rich, with respect to health and long life, as the narrowness of their circumstances prompts them to labour, and withdraws all temptations to luxury" (Mackenzie, 1759, p. 419). The lack of health among people in the emerging industrial working class despite their active working lives was often put down to vice and bad air, but for many observers peasants remained a model of healthy living. In October 1821, the English writer Marianne Baillie wrote about her experiences travelling in Portugal, suggesting that agricultural labour was good for the body. "The peasantry appear to enjoy far better health," she wrote, "perpetual exercise under the influence of summer's sun and winter's wind, hardens their muscles and reduces their flesh" (Baillie, 1824, p. 1.219). Isaac Fuller's personification of exercise represents this image of the healthy peasant (Figure 6.1).



Figure 6.1 "Exercise" by Isaac Fuller. Courtesy of the Wellcome Trust.

While only a tiny minority of elite utopians might have contemplated taking up the life of an agricultural labourer on political and health grounds, there were forms of manual work that were encouraged. William Buchan advocated gardening, for instance, writing that "After working an hour in a garden, a man will return with more keenness to his employment within doors, than if he had been all the while idle. Labouring the ground is every way conducive to health" (Buchan, 1797, p. 54). And the Rev. Thomas Scott, a vicar in the East Yorkshire city of Hull, wrote in a letter of 1811 that,

> Air and exercise, however, are the most universally successful remedies. Desks, and counting houses, and studies, and endless application, and anxious care, on the one hand, and indolence on the other, are the great sources of these maladies. Except in the depth of winter, I work as a labourer, two or three hours every day in my garden, to counterbalance the application of my study. Let nothing hinder you from using exercise to the very border of wearying yourself, and in the open air. This is my prescription: and no good physician will refuse to set his name to it.
>
> (Scott, 1826, p. 167)

Buchan's framing of "the right amount of exercise" in terms of morality was echoed in Fuller's *Medicina Gymnastica*, in which he pointed at indolent lifestyles as the cause of most chronic diseases: "it is our choice" he argued, "whether a cough shall run on to a consumption … I say, it is high time to look out, and set upon a resolute course of riding" (Fuller, 1777, p. xx). Cadogan made a similar argument in his treatise on gout. In line with Enlightenment educational ideals, Cadogan addressed his treatise "to all invalids." With a strong appeal to "the light of reason and philosophy," he argued that man should have a better understanding of the natural causes of his predicaments in order to change his ways (Cadogan, 1772, p. ix). Gout, so Cadogan argued, is not a hereditary condition nor is it inherent in our constitution. Instead, we bring chronic diseases upon ourselves by indolence and intemperance. The first relates to inactivity, the latter to excessive eating and drinking. It follows that, rather than medical remedies, activity and temperance can alleviate the effects of these bad habits. It follows also that Cadogan advised "temperance" in eating, *but not in exercise*. On the contrary,

> all men should labour, every one for himself. … The rich and the great have so far forgot this first principle of nature, that they renounce all bodily labour as unworthy of their condition, and are either too lazy or too inattentive to substitute exercise instead of it.
>
> (Cadogan, 1771, p. 28)

In other treatises as well, active exercise is separated from the principle of temperance. The anonymous writer of *An Essay on the Most Rational Means of Preserving Health* (1799) wrote that "it was the opinion of Hippocrates, that

the preservatives of health are temperance and exercise" (Anon., 1799, p. 4). James Mackenzie likewise remarked that "the great preservatives of health are temperance and exercise." He furthermore stated that diet and exercise should be in perfect equilibrium. Many ailments originate from an imbalance, which can be helped by adjusting either diet or exercise. Thus, "the meagre should be plumped up by very gentle exercise, and long intervals of rest," while "fat persons should be made thinner by warm bathing, strong exercise, hard exercise, hard beds, little sleep, proper evacuations, acids and one meal a day" (Mackenzie, 1759, pp. 117, 141–142).

It follows that rather than moderating exercise as was customary from the sixteenth century onwards, physicians argued that "strong exercise, in a significant workout" (*Encyclopédie*, 1751–1772, pp. 14.628–630) were signs of a healthy temperament.[5] Moderation was a matter of a correct balance between exercise and rest as well as a principle particular to each constitution. Based on this idea, Andrew Harper (d. 1790) in his *Oeconomy of Health* identified two errors in economising health and exercise. The first being that "people of relaxed, delicate and nervous habit, who should always avoid too much action, at one time, often hurt themselves by overexertion, because they judge it advisable to take plenty of exercise." The other mistaken notion is that people "who being confined within doors, and leading a sedentary life, think to compensate for the want of regular exercise, by a hard ride or walk, once a week" (Harper, 1785, p. 20). Thus, although strong palpitations in any part of the body and an extraordinary pounding of the heart were still considered harmful, it was no longer considered a reason to stop exercising altogether. On the contrary, sweating and hard breathing were seen as important signs signalling the need for proper breaks in between exercises. In *Hippocrates' Treatise on the Preservation of Health*, it was argued that:

> When he feels himself sweat, tired, and short breathed, he should desist, until he recovers himself; and when he has fully recovered himself, let him resume his exercise, and continue it as long as he can with ease and pleasure. But he exerts himself too much, if he persists until he grows quite weary, pale and languid.
>
> (Anon., 1776, pp. 32–33)

In a similar line, Andrew Harper argued that "In all cases let this be an invariable rule, that real wariness and fatigue should mark the precise limits of every species of exercise and labour" (Harper, 1785, p. 22). Harper's rule exemplified the eighteenth-century new attitude to vigorous exercise. As gentle exercise was increasingly identified with immoral elite behaviour, medical writers emphasised that "out of breath" and "sweating" were not necessarily signs of overexertion. Yet, the precise meaning of "real wariness and fatigue" was a matter of individual decision and self-control.

Exercise for weak bodies

While regimen is not directly about medical treatment per se, but rather for maintaining health, for obvious reasons the people who were most interested in advice on healthy living were those who were ill in some way. It is thus not surprising to find that most dietetic advice on regimen and exercise was directed at people suffering from weaknesses in body or mind, who were perhaps incapable of real exertion. As the Scottish poet and physician John Armstrong (1709–1779) put it in his 1744 poem *The Art of Preserving Health*:

> Few bodies are there of that happy mould
> But some one part is weaker than the rest:
> The legs, perhaps, or arms refuse their load,
> Or the chest labours. These assiduously,
> But gently, in their proper arts employ'd,
> Acquire a vigor and elastic spring
> To which they were not born. But *weaker parts*
> *Abhor fatigue and violent discipline.*
>
> (Armstrong, 1744, pp. 71–72, our italics)

As a result of the fading distinction between healthy exercise and labour, physicians generally agreed that strong bodies (i.e. labourers and all those involved in daily activities) were least in need of exercise. The health rhetoric of strength and vigour was mainly directed at weak constitutions, those who were least likely to enjoy regular exercise because of various ailments, including ones that were the result of vice and sloth. For this reason, much eighteenth-century advice on exercise involved a regime directed towards building up strength, often starting with "passive" forms of exercise and involving exercise machines, and also the promise of pleasure that people would experience if they started a proper course of exercise (Figure 6.2).

The whole concept of passive exercise may sound like an odd idea to some modern ears, but was a commonplace of eighteenth-century medicine, especially with reference to valetudinarians. Willich, in his discussion of healthy exercise, listed "passive" forms of exercise, including "riding in a carriage, failing, friction, swinging, &c" along with "active" exercises such as "walking, running, leaping, swimming, riding, fencing" that might seem more familiar (Willich, 1809, p. 276). Similarly, James Mackenzie noted that if it were necessary to exercise indoors, as well as doing things such as "shuttle-cock, billiards, hand-ball, dumb bell, &c.," people could also "chafe" their bodies "with a flesh brush in the morning" (Mackenzie, 1759, pp. 418–419).

As this suggests, various ways of rubbing the body ("friction") were understood to be forms of exercise that were especially suited to valetudinarians. These techniques were often compared to the rubbing down of horses (Cheyne, 1724, p. 108) and to massage practices from ancient bathhouses (Fuller, 1777,

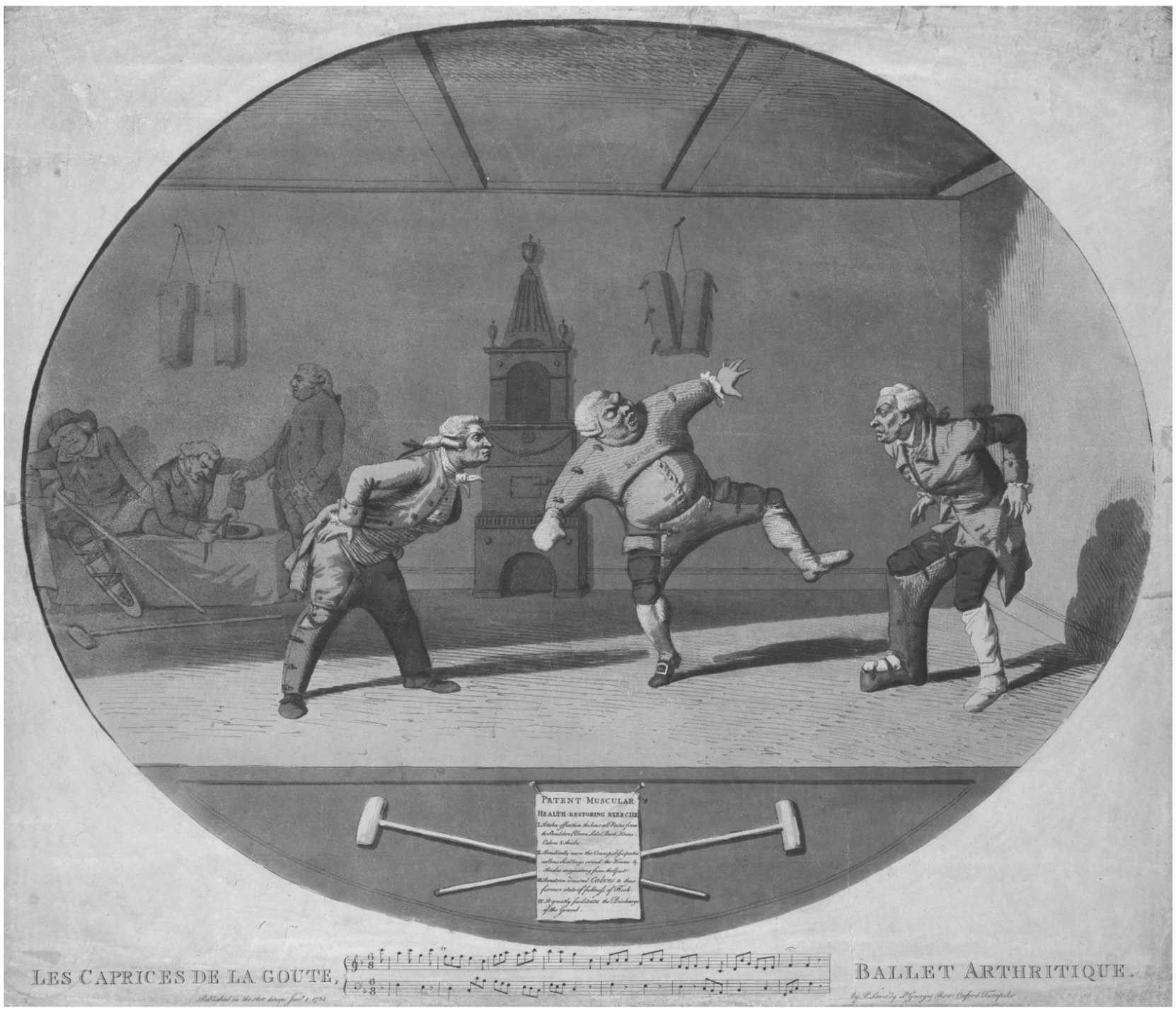


Figure 6.2 "Les Caprices de la Goute: Ballet Arthritique" by Paul Sandby (1783). Courtesy of the permission of the Wellcome Trust.

p. 216). John Hill's *The Management of the Gout* (1764) (part of his *Old Man's Guide to Health*) suggested that friction was perfect for those who were "too weak for exercise," saying "its effects are more than can be imagined," especially in terms of the body's fluids, since the "great benefit of exercise is assisting circulation" (Hill, 1764, p. 22). John Sinclair was also keen on friction as exercise, particularly praising the so-called flesh brush. He wrote that,

> There is no subject to which it is more necessary to call the attention of every individual, desirous, of preserving health, or attaining longevity, than to the advantages of friction … . When the stomach is disordered, or incapable of performing its functions, rubbing the belly with a brush, or with flannel, is of great use. Friction, thus applied, for half an hour every morning, (and for the same space at night, if it should be necessary), will strengthen the stomach, and organs therewith connected, more than moderate exercise for a whole day.
>
> (Sinclair, 1807, 1.219)

Attitudes towards the health benefits of active and passive exercise were particularly relevant when it came to questions of weaker patients moving by

riding a horse, by carriage or sedan chair. Riding was widely regarded as an excellent form of exercise. Buchan suggested that everyone able to do so should spend two or three hours on horseback every day (Buchan, 1797, p. 74). Even more than walking, managing a horse and holding the body upright would fully exercise the body's powers and exertions and would stimulate a free digestion (Anon., 1776, p. 32). Cheyne argued that although walking was the most natural, horse riding was the most manly and healthiest way of getting about. "It is the least laborious, while it shakes up the whole machine, promoting a universal perspiration and secretion of the fluids" (Cheyne, 1724, p. 49). Francis Fuller was explicit about the benefits of horse riding, arguing that riding combined active and passive exercise and so represented the perfect balance between exercise and rest. The lower parts of the body are active, while the upper parts of the being are relaxed, affording an equal secretion of particles. Riding was especially useful in clearing up obstructions in the lower belly as Fuller had experienced himself:

> I may be allowed to have had some more than common occasion to put me upon making these observations, having some time ago been so unhappy as to labour under a severe flux as perhaps ever was known, which held me about a year and a half, attended with vomitings, and most insupportable nervous symptoms; during all which time nothing relieved me, in the greatest paroxisms of it, like gentle riding; insomuch that at last I was forced to be in a manner always on horseback, to have the pressure on my bowels rebated, and my spirits a little refreshed.
>
> (Fuller, 1777, pp. 168–169)

What, then, of travelling by carriage? Few today would believe that it constitutes a form of exercise, but in the eighteenth century the involuntary movements involved were often regarded as a suitable form of exercise for the weak. As Willich put it, "The gentle jolts tend to resolve stagnations in the intestines of hypochondriacs, corpulent people, convalescents, and the consumptive" (Willich, 1809, p. 283). However, as the century wore on, riding in carriages was increasingly seen as a lazy and unhealthy form of ostentation. Willich also warned that,

> if the motion of the carriage be too rapid, it is hurtful, as it not only accelerates perspiration, before the matter of it is properly prepared, but also injures the solid parts, especially the kidneys; generates congestions of the blood towards the head, and consequently head-ach, giddiness, vomiting, and obstructions.
>
> (Willich, 1809, p. 283)

The sheer expense of travelling in this manner, paying for horses, coach and driver, meant that there was an association between riding in a carriage, luxury and morbid excess. The anonymous *Manual for Invalids* (1829) lamented the

"influx of riches," which had led to it becoming "very fashionable to adopt the passive mode of exercise, viz. the various vehicles of carriages" instead of actively riding a horse oneself (Anon., 1829, p. 191). In this context, others claimed that riding in a carriage is "no exercise at all":

> It may lead to change of air, indeed; but with regard to the body, the jostling of a coach heightens more distempers than it alleviates. How partial the motion is, with regard to the body, may be experienced by any person, who has ridden for a day in a coach: how stiff the lower limbs are, and often affected with a temporary palsy, to such a degree, that the person often staggers, after coming out of a coach, from a long journey.
>
> (Anon, 1799, p. 24)

The sedan chair, symbol of *ancien régime* privilege, was subject to a parallel medical-moral debate about its impact on health. In the preceding century, some physicians had deemed travelling in one as sufficient exercise, even for men in their prime (Cavallo and Storey, 2013, p. 150). But by the final decades of the eighteenth century, it had come to be associated with indolence and other vices. While some such as John Fothergill were still happy to promote being "carried a little way in a sedan chair" as "very healthful" (Fothergill, 1770, p. 38), others were openly scornful. William Buchan warned that in particular those who continually use sedan chairs and coaches are "in some danger of losing the use of their limbs altogether." "How ridiculous it is," held Buchan, "to behold the young and healthy swinging along on the shoulders of their fellow creatures! Or to see a fat carcass, overrun with diseases, occasioned by inactivity, dragged through the streets by half a dozen horses" (Buchan, 1797, p. 72) (Figure 6.3).

For valetudinarians who, for whatever reason, could not leave the house, the dietetic literature sometimes promoted the so-called chamber horse (see Figure 6.4), a spring-loaded machine on which people could bounce up and down in imitation of the movement of riding on a horse (Flynn, 1990), which had been around since Henry Marsh began advertising the device in 1739. Physicians such as John Fothergill advised the use of "the chamber-horse or tremoussoir" to aid digestion (Fothergill, 1770, p. 38), and it was widely prescribed for those who could not travel by coach. Writing to the Scottish evangelical aristocrat Lady Henrietta Hope in December 1780, Lady Darcy Maxwell advised her to respond to the necessity of being confined indoors by trying "a chamber horse" for the sake of her stomach. "Whatever does not digest creates flatulency, and greatly increases these panics and unpleasant sensations you mention. Even port wine I find frequently heavy upon my stomach" (Lancaster, 1840, p. 181). Among those who themselves bounced up and down on a chamber horse were the clergyman John Wesley and the novelist Samuel Richardson (himself a patient of George Cheyne) (Wesley, 1967, p. 256; Mullet, 1943, pp. 26–27).

Some forms of exercise open to valetudinarians also offered a spur to activity – pleasure. The relationship between physical pleasure, health and

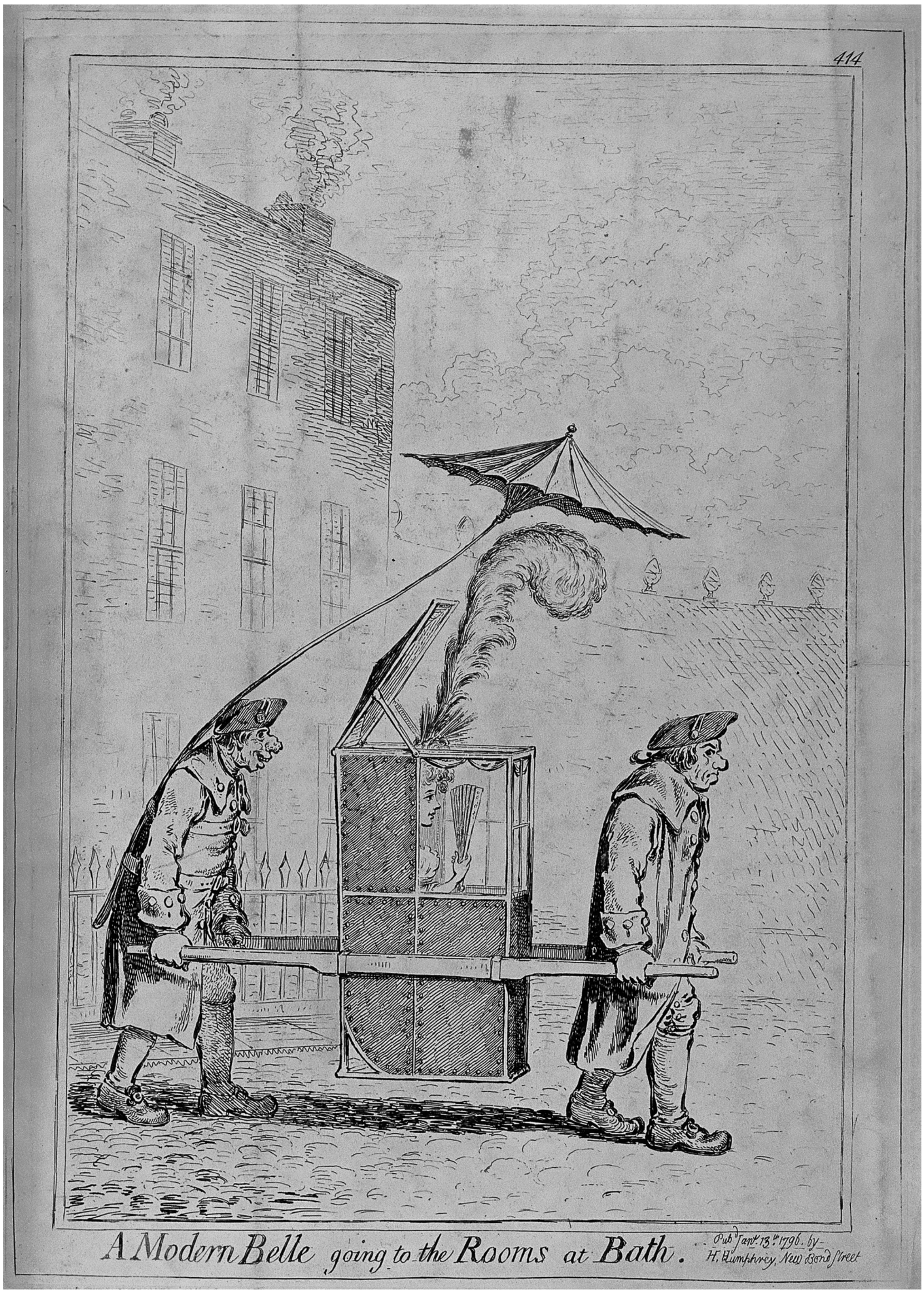


Figure 6.3 "A modern belle going to the rooms at Bath" (c. 1796). Courtesy of the Wellcome Trust.

Enlightenment has recently been the subject of interest for a number of prominent scholars, for instance, in terms of sex (Kavanagh, 2010) and food (Spary, 2012), and exercise, too, was discussed in such terms. Indeed, sex itself was depicted (in more or less decorous ways) as a salutary form of exercise. Willich, for instance, wrote that, if conducted in moderation by suitable couples, "sexual intercourse" aided the "flexibility of their vessels, the strength of their



Figure 6.4 Exercise chair, or chamber horse (c. 1790–1820). Courtesy of the Victoria and Albert Museum, London.

muscles, and the abundance of their vital spirits" (Willich, 1809, p. 340). More broadly, the positive emotions and sensual enjoyment created by exercise were themselves understood to offer health benefits. In the summer of 1779, Samuel Johnson wrote to two sick friends that "Cheerfulness and exercise are your great remedies. … Labour is exercise continued to fatigue, exercise is labour used only while it produces pleasure" (Allen, 2012, p. 10).

Pleasurable eighteenth-century categories of exercise that were open to those not in full possession of their health included oratory and reading aloud. John Sinclair's *Code of Health and Longevity* praised them as "one of the most useful sorts of exercise," even suggesting that "schoolmasters and university men" lived long lives because of the way they practised this form of exercise (Sinclar, 1807, p. 1.640). Likewise, Mackenzie's *History of Health* compared them to "riding in any easy chariot," noting, though, that even this activity was not without its perils. Mackenzie, for instance, suggested that "violent vociferation may prove pernicious, as it has been frequently the cause of bursting some blood vessel" (Mackenzie, 1759, pp. 155–156). Even laughing was sometimes portrayed as a salutary form of exercise. For instance, the anonymous physician

who wrote *Letters to the Ladies, on the Preservation of Health and Beauty* (1770) described it as "extremely serviceable," while giving an account of an ancient Greek painter named Zeuxis who died of laughter as a warning (Anon., 1770, p. 166). But generally it was singing that was the subject of the most discussion in the dietetic literature of the period (see Chapter 12). Bernard Lynch's *Guide to Health* (1744) set out music's benign impact on "the fibres of the whole body," which made the nervous fluid more "briskly agitated," ensuring that it was a "very useful" form of exercise (Lynch, p. 285). Sinclair noted the "beneficial consequences" of singing on the lungs and its "enlivening effects upon the mind" (Sinclair, 1807, p. 1.641).

Singing could also be a danger, however, if taken to excess (Kennaway, 2012). As a sensual pleasure, it was open to a moralising critique. The influential Swiss physician Samuel Auguste David Tissot, in his *Essay on the Disorders of People of Fashion*, argued that those suffering from consumption "should avoid singing; and vocal music ought to be banished from the education of young people whom we may suppose to have this disorder" (Tissot, 1770, vol. 3, p. 129). Likewise, A.F. Crell's *The Family Oracle of Health* (1824) warned that it could lead to a sore throat or hernias (recommending "Mr. Cole's truss, of London Bridge" for the latter). The problem was that "the exercise of singing drives a greater supply of blood to the organs exerted. Now this tide of blood may, according to circumstances, either contribute to strengthen the voice, or to produce inflammation of the throat." This inflammation was no laughing matter, but could

> be so violent as to cause sharp pain and swelling of the throat, with high fever, great anxiety, shrill, and suffocative breathing, and difficulty of swallowing … . The face is swelled, the eyes start out as in cases of strangling, and the patient calls for air as if in the agonies of death, which usually occurs in a day or two, unless the disease is subdued.
>
> (Crell, 1824, p. 317)

The apparent popularity of singing, flesh brushes, sedan chairs and carriages show that passive and gentle exercise was still popular at a time when medical discourse increasingly emphasised fibrous strength and exertion. However paradoxical this might seem, attitudes towards these forms of gentle exercise shifted. In the preceding centuries, gentle exercise was aimed at "physical elegance and dexterity of movement," in aid of maintaining the "stressless grace and harmony" of the noble body, in stark contrast with the robust body of the peasant and the hardened body of the soldier (Cavallo and Storey, 2013). During the eighteenth century, gentle exercise was increasingly considered suitable for weak, ageing and diseased bodies. Even Cadogan, whose promotion of hard labour for the gouty rich caused uproar among his contemporaries, stated that the very ill should first undergo gentle exercise. He argued that "a certain activity or bodily motion is necessary at intervals every day, to raise the circulation to that pitch, that will keep the fine vessels open and the old

blood pure, and also make new from the fresh juices." Cadogan warned that if the patient cannot be brought to walking or horse riding, "he has no chance of recovering to perfect health" and he appeals to "the assistance of others" in order to gradually bring the sufferer to do both. He recommended that one or two servants rub the patient all over as he lies in bed. This will "contribute greatly to brace and strengthen his nerves and fibres, and move his blood without any fatigue to himself." Additionally, "if he can bear a carriage, let him go out in it every day." Yet, as soon as he can he must walk or ride every day a little more until he gains strength "which he must employ, as young merchants do a little money, to get more" (Cadogan, 1771, pp. 84–86). Cheyne likewise argued that "those who cannot ride, must be carried in a coach or a litter," stating that this is "the best exercise for the lame and crazy, and the only one proper for old and decrepit persons." Gentle exercise, in other words, became disconnected from genteel bodies. Instead, it was increasingly associated with those who were too sick or weak to practise the truly healthful more vigorous exercises.

Conclusion

As this chapter has argued, thinking on exercise and health during the long eighteenth century was marked by a shift from a focus on moderate exercise sharply distinguished from labour towards a new openness towards real exertion and away from fears of the medical impact of "excessive" physical activity. The new physiology aided this by providing a rationale based on restoring vigour in the fibres rather than maintaining balance in the humours. Fibres were increasingly thought of as storages of vital powers that were considered essential for life and motion in the body. Strong and vigorous fibres were seen as the basis of lively and healthy bodies. Not surprisingly, the building up of muscular strength through exercise became a synonym for a healthy lifestyle.

At the same time, gentle exercise continued to be stressed for valetudinarians, the focus of much of the dietetic discourse on exercise. The eighteenth-century model of the fibrous body was an optimistic model. It dovetailed with Enlightenment ideas on the perfectibility of human nature, including not only the mind but also the body in arguments over restoring and increasing life, health and happiness. Many chronic diseases were generally depicted as self-inflicted, resulting from the vices of indolence and intemperance, and exercise was often framed as the best way to rectify bad habits. Indeed, exercise became a moral duty, in particular for the weak and disabled. In accordance with these arguments, the meaning of gentle and passive exercise changed. More than ever before, it was cast in a rhetoric of "building strength" and prescribed to invalids who were incapable of doing the "proper" exercises of riding and walking. The revival of the flesh brush best shows how new physiological ideas on vital fibres led to a renewed medical appreciation of exercise for valetudinarians. No other instrument provided a better vigorous exercise of the smallest fibres without exertion for the patient.

In this context, however, the influence of changing medical theory in these shifts was matched by the impact of moral and religious arguments. Perhaps more than in relation to any of the other non-naturals, medical advice on exercise fitted with the egalitarian logical consequences of Enlightenment arguments and therefore threatened the social and political status quo. Roy Porter argued that eighteenth-century elite societies associated themselves with the elevation of the mind over the body, which justified their domination over the plebs. They invented innumerable forms of discipline (among them dieting, exercise, hygiene, schools and workhouses) in order to keep a hold on rank, foul and dysfunctional bodies (in particular those of the lower classes) (Porter, 2003, pp. 25–26). Yet, as is clear in the material described in this chapter, exercise regimes were invented not so much for the labouring classes but for elites who were supposedly suffering the consequences of luxurious and indolent lifestyles. Rather than repressing poor bodies, their strength was put forward as a moralising mirror to show the vices of the well-to-do. In our own time, many of these assumptions have, of course, been turned on their heads, with a sententious discourse on the lazy, fat poor replacing one on the idle rich, but the persistence of moral and political agendas in discussions of exercise remains obvious.

Notes

1 "Fluidité … de la chaleur naturelle".
2 "l'exercice, l'âge viril augmente le sang renfermé dans les vaisseaux sanguins, sa rougeur, sa force, sa densité, la cohésion de ses parties, la dureté du serum coagulé, son poids & ses principes alkalis".
3 "On restreint cependant la signification d'*exercice* en général, à exprimer l'action du corps à laquelle on se livre volontairement & sans une nécessité absolue, pour la distinguer du travail, qui est le plus souvent une action du corps à laquelle on se porte avec peine, qui nuit à la santé & qui accélere le cours de la vie, par l'excès qui en est souvent inséparable."
4 Cadogan's argument that physic could not cure the ill effects of indolence, intemperance and vexation, caused uproar among physicians who feared a dwindling of their lucrative businesses (Digby, 1994, p. 206). An anonymous lady wrote, "Disciples of Galen, all shut up your shops,/No need, have we now, of your balsams and drops;/ Dear volatiles, cordials, and bracers, adieu!/Ye must give place, to a system quite new" (A Lady, 1771, p. 7).
5 "C'est aussi une marque de bon tempérament & d'une disposition certaine à une santé durable, lorsque l'on peut se livrer à un exercice assez fort, à un travail du corps assez considérable."

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7 The healthy body, civic virtue, gender and the new physical education in Germany, 1770–1800

Teresa Sanislo

In 1802 Christian Gotthilf Salzmann, an educator and founder of an experimental boarding school in Schnepfenthal near Gotha, published a small book with illustrations entitled *Taschenbuch zur Beförderung der Vaterlandsliebe*. He wrote the book hoping to inspire pride and enthusiasm for patriotic acts and achievements in the German states. Not surprisingly, an entire section of the book is devoted to educational reform. Figure 7.1 shows a teacher watching over his male students as they engage in outdoor physical activities. The little boys are playing around the teacher and the older boys are swimming in a river or pole-vaulting over a stream. The boys are active, their bodies are hardened and the muscles of the swimmers are well defined. The text next to the image boasts about the improvements that German educators have made in the physical upbringing of young people. The text is intended to convince the public to recognise the value and be proud of the "service" that progressive educators were rendering in this area. Salzmann notes that young children had been freed from swaddling, the corset and unnatural dress. Their feather beds had been burned, their nerves steeled with cold bathing and their bodies strengthened through physical activity and gymnastics. Closing this section, he confidently states that "in regions where people have followed the principles of the new upbringing, child mortality rates have been reduced. I do not think it is too much to assert that Germany now saves a hundred children a year who would have otherwise died" (Salzmann, 1802, p. 21). In this text, Salzmann links the idea of patriotism with a concern for physical fitness, child mortality rates and a healthy strong population. His book draws attention to the fact that the impetus for change in this area came from "patriotic" men like him, progressive educators who offer their service in the interests of the common good.

Salzmann's chapter and the illustration published with it are emblematic of a larger shift in the discourse and practice of patriotism that was taking place in the German states in this period. In the last few decades of the eighteenth century, Salzmann and other Enlightened educational reformers who called themselves the Philanthropinists drew attention to the public significance of the healthy, well-trained body, particularly the well-trained male body. They publicised the discourse on the non-naturals from the medical literature of the period. In their publications and practical work at their schools, they asserted



Figure 7.1 Illustration from C.G. Salzmann's *Taschenbuch zur Beförderung der Vaterlandsliebe* (1802). Courtesy of the Rubenstein Library, Duke University.

that a hardened, trained body was an essential trait for a useful member of civil society (*bürgerliche Gesellschaft*). They claimed, therefore, that both those who promoted physical hardening and physical exercise and those who engaged in it were good "patriots." By invoking the language of the common good and civic virtue in this way, the Philanthropinists created the possibility for a new patriotic self-fashioning grounded in physical culture.

The Philanthropinist programmes for physical education demonstrate the longevity and international scope of the discourse on the non-naturals and healthy living in Europe. To legitimise their programmes, the Philanthropinists cited a range of medical experts who were advocates of preventive medicine, from Galen in ancient Greece to Humanists like Mercurialis in the seventeenth century and physicians in eighteenth-century France, Switzerland and the German states. Yet, their work also illustrates themes that have been central to the recent historiography on the history of medicine and healthy living: the fact that the discourse on the non-naturals changed over time and was transformed by the process of dissemination beyond the medical community

and changing political, social and cultural contexts (Cavallo and Story, 2013, 2017). The Philanthropinists prescribed a wide range of practices for healthy infant and child care, including the proper management of diet, air, sleep and the passions. Yet, they rejected ideas that had been important to preventive literature centuries earlier, such as swaddling and warm bathing, and embraced exposure to the cold (air and water), a concept that became fashionable in the late seventeenth and eighteenth centuries (Jenner, 1998; Smith, 2007; Astbury, 2017). They elevated the importance of one of the long-established non-naturals: motion and exercise. Finally, they placed great emphasis on the benefits of healthy living not simply for ensuring healthy bodies but also for building character. As educators, they stressed the importance of health and strength for building self-control, satisfaction and the ability to perform social roles in civil society. They praised the benefits of physical activity for all children but reserved specific, hardier exercises and training programmes for upper and educated middle-class men.

An analysis of gender in the work of the Philanthropinists explains why one non-natural, exercise, figured so prominently in their programmes for healthy living and highlights the ways in which the discourse on the non-naturals were employed to construct gender ideals and identities. The Philanthropinists raised alarm about the dangerous effects of a modern, effeminising, civilised lifestyle for male bodies and character. They argued that exercise and gymnastics were needed to revive "natural" masculine traits such as strength, will-power, self-control and courage, attributes that they argued were as essential as masculine rationality for carrying out male civic duties. They promoted gymnastics in order to manage or balance what they saw as divergent elements of masculinity; rationality and intellectualism vs. physical strength and prowess. The Philanthropinists reversed gendered cultural codes (nature/culture, body/mind, female/male) that many feminists theorists have argued were central to the language of civic virtue and citizenship in this period (Hausen, 1981; Frevert, 1988; Jordanova, 1989; Schiebinger, 1989; Honegger, 1991; Outram, 1995). An analysis of Philanthropinist discourse on gender, lifestyle and exercise suggests that it is important to recognise the tensions generated around gender ideals and practice and the multiple ways that gendered oppositions and meanings can be configured in a given historical context. The work of the Philanthropinists, including the specific ways in which they employed the discourse on the non-naturals, can only truly be understood by contextualising it within the broader history of the medical Enlightenment, an emerging civil society and the construction of gender ideals and identities in eighteenth-century Germany.

Health, civic virtue, and patriotism in late eighteenth-century Germany

Eighteenth-century Germany witnessed an extensive and substantial public discussion of health and illness. In the first half of the century, articles on dietetics, health and hygiene appeared frequently in the new moral weekly

periodicals. By the second half of the century, there was a virtual flood of new medical texts written for a scholarly, bureaucratic and educated public. While doctors published growing numbers of new handbooks on healthy living and a series of new, popular medical periodicals, Cameralists (German theorists of effective government bureaucracy) engaged in extensive discussions of "public health" in the literature on state administration and policing. Enlightened physicians also began to use almanacs, calendars, pamphlets and popular literature to spread medical enlightenment to the common man (Frevert, 1991; Lindemann, 1996).

As historians of the social history of medicine have argued, proposals for Enlightened reform and improvement were often carried out upon the terrain of the body, be that the individual body or the body politic. An Enlightened worldview fostered a new optimism regarding the human ability to understand, regulate and positively affect his physical condition. The attempt to discover natural laws upon which human interaction, politics and society could be based also included efforts to determine the "rational" and "natural" basis for physical well-being. With a profound faith in the perfectibility of man, enlightened thinkers across Europe sought to disseminate information about healthy living and combat "superstition" and "prejudice" in matters relating to health and the body (Coleman, 1974; Jordanova, 1979; Porter, 1985; Lawrence, 1994). The doctrine of the non-naturals provided the framework for the Enlightened rules for healthy living. The theory of the non-naturals, which emphasised the profound effects of certain "external" factors on one's health and physical well-being, originated in ancient Greece and informed western European medicine for centuries. According to the Galenic tradition, the non-naturals included factors such as air, food and drink, exercise and motion, sleep, evacuation and retention and the passions of the soul. Galenic texts outlined the effects of these factors on the body and provided guidelines and rules of dietetics for regulating them (Niebyl, 1971). The non-naturals remained a central part of eighteenth-century medical advice. Familiarity with the non-naturals provided the means through which an individual could supervise, regulate and maintain health.

Social historians of medicine argue that the attention to external factors at the heart of the doctrine dovetailed with the environmentalist tendency of the Enlightenment. Eighteenth-century physicians expanded upon Galen's list, exploring the significance of factors such as housing, dress, luxury items and levels of cultural refinement and examining the effects of climate, occupation and lifestyle on the body. The popularity of the discourse on the non-naturals in this period built upon Enlightened notions of nature as the source of inspiration and faith in the ability of man to be educated. Enlightened physicians argued that the principles of dietetics were grounded in the laws of nature and hence formed the basis for a rational, natural regulation and management of the body. They called upon individuals to become knowledgeable about their health and masters of their bodies (Colemann, 1974, 1977; Porter, 1985; Duden, 1991; Frevert, 1991; Lawrence, 1994; Lindeman, 1996).

In this period, health was not simply a private matter; it became a political and social issue. The politics of the continental absolutist state and the rise of civil society contributed to the politicisation of the body by investing the healthy body with a new public significance. Cameralist theorists and Enlightened rulers recognised a healthy, expanding population as the foundation of a powerful state and promoted the idea of mutual obligation of the ruler/state and the subject to promote and maintain "public health" (Rosen, 1974; Jordanova, 1981; von Unruh 1983; La Berge, 1984; Frevert, 1991; Hull, 1996). The public interest in health was also a direct consequence of the formation of a new civil society and public sphere, as well as the diffusion of bourgeois cultural ideals. Within the moral discourse of an emerging civil society and the public sphere, healthy living became a precondition for social and civic life. Only the healthy individual, many argued, could develop and expand his powers, put them into the service of the general good and fulfil his place in civil society. Health figured as the basis for individual happiness and the collective good (Frevert, 1991; Lindemann, 1996).

The politicisation of the body opened up the space for envisioning and promoting a new physical education for young people. The discourse on health and civic virtue focused attention on population, reproduction and the body of the child as the future subject/citizen. Calls for reforms in physical upbringing of youth, including increased movement and exercise, became a central platform of the German literature on healthy living and medical policing. S.A. Tissot, the Montpellier-trained Swiss physician whose multiple works on healthy living and public health made him famous across Europe, promoted movement and exercise in his work. His text on the ill health of scholars was translated into German and published in multiple editions by the early 1770s (Emch-Dériaz, 1992). Influential German doctors, such as J.C.G. Ackermann (who trained in Göttingen and taught at Halle) and J.P Frank (who trained in Strasbourg and Heidelberg and taught at Göttingen, Pavia and Vienna), drew on Tissot's work and included fragmentary discussions of new physical education published in the 1770s and 1780s.[1] J.S.P. Franz and J.G. Essich produced new handbooks in German devoted entirely to promoting reforms in the physical upbringing of young people. Like physicians in England, France and Switzerland, doctors working in the German states built upon and contributed to a growing vernacular literature on physical education and exercise.[2]

The Philanthropinists, a small but influential circle of Enlightened pedagogical reformers in the German states, picked up the theme of physical education and training and integrated it into their educational philosophy.[3] The founder of the movement, Johann Bernhard Basedow, was originally from Hamburg and studied in Kiel and Leipzig. After graduation, Basedow worked as a private tutor, a teacher at an aristocratic school in Denmark (where he was fired for advocating religious tolerance) and at a gymnasium in Altona. By the 1770s, he had published a series of texts on education and established a name for himself as a proponent of enlightened educational reform. Basedow was inspired by the philosophies of Wolf, Locke and Rousseau. He was critical of clerical influence

in the schools and the humanist idea of a purely classical education. He called for a well-rounded, non-confessional education for all children built upon the principles of nature and the natural disposition of the child. His "Philanthropic" education aimed to develop the full capacities of students and, at the same time, prepare them for happiness and fulfilment in harmony with their vocation or destiny in civil society. He combined the idea of individual or personal development (*Bildung*), therefore, with a utilitarian perspective. Basedow secured the financial backing of the Duke of Saxon-Anhalt to put his ideas into practice in a new model school and teacher training institute in Dessau in 1774. Basedow's new school was non-confessional and open to nobles and non-nobles alike. It was a private boarding school and as such it attracted primarily wealthier students from Germany and other European states. Basedow drew progressive educators from across the German states who identified with the movement for Enlightenment, such as Joachim Heinrich Campe, Ernst Christian Trappe and Christian Gotthilf Salzmann, to train and work at the school.

The Dessau Institute and the Philanthropinist educational philosophy associated with it drew widespread attention across the German states. Basedow's writings and practical work at the school were widely discussed in the public sphere and received praise from influential intellectual figures such as Kant and Goethe. Von Rochow, a prominent Prussian nobleman who sponsored Enlightened educational reforms on his estates, lent support to the school and sent young men to Dessau for teacher training. Basedow was a poor administrator and proved to be hard to work with, however. Campe took over the directorship after one year and then left. From that point on, the school went through a series of new directors and had high staff turnover. It eventually closed in 1793.

Despite the turbulent history of the Dessau institute, the Philanthropinist movement as a whole thrived in the last few decades of the eighteenth century. Former Dessau instructors often disliked Basedow on a personal level, yet they continued to promote many elements of his educational reform agenda and refine his theory and methods. The Philanthropinist journals, *Allgemeine Revision des gesammten Schul- und Erziehungswesens* (1785–1791) and *Braunschweiges Journal* (1788–1791) edited by Campe, Trapp and Stuve, were quite successful. Trapp was appointed to a new chair in pedagogy at the University of Halle. After leaving Halle, he, Stuve and Campe worked for a number of years as educational reformers for the Duke of Braunschweig-Wölfenbüttel. Campe produced numerous books on educational theory and various other topics. He was an ardent supporter of the French revolution and his reports on events in Paris during the Revolution and honorary French citizenship helped spread his fame across Germany. Salzmann published a number of pedagogical treatises and popular didactic novels. The founding of a handful of other Philanthropinist schools also contributed to the reputation of the movement; the success of Salzmann's school in Schnepfenthal (1784 to present) ensured that the Philanthropinists' educational model continued to capture public attention up until the turn of the century and beyond.

The promotion of healthy lifestyles and exercise was central to the Philanthropinist movement. Basedow referred to the idea of a new physical education and training as early as the 1770s in his most famous books *Das Methodenbuch für Väter und Mütter der Familien und Völker* and *Elementarwerk*. Although he only touched on this idea in fragmentary ways, his followers produced more expansive discussions of a new physical education and culture for the youth in the 1780s. Salzmann, Stuve, Campe, André and Villaume all discussed this theme in detail within their general essays on a new Enlightenment pedagogy and their school reports.[4] Stuve and Villaume even published articles specifically on this theme in 1781 and 1785. Gutsmuths' *Gymnastik für die Jugend* published in 1793 is the most extensive discussion of the philosophy and programme from this movement. Johann Christoph Friedrich Gutsmuths studied at Halle, became a private tutor, and then worked for the rest of his life as the gymnastics instructor at Salzmann's school in Schnepfenthal. His book on gymnastics represents the culmination of two decades of efforts to publicise and promote reform in this area.

The Philanthropinists drew upon the medical literature of the period citing physicians publishing in the German states, Switzerland, Britain and France. They set themselves up next to physicians as propagandists for healthy living and a rational regulation of the body based on the non-naturals and dietetics. Throughout their texts, they claimed that knowledge of the body, the relationship between the body and the mind and the importance of health and strength for character building were integral parts of an education that would build happy and useful members of society. Although the Philanthropinists argued that all children and young people should engage in movement to become healthy, productive members of civil society, they stressed that young men – particularly educated middle-class men – desperately needed physical training and gymnastics to protect their masculine character. They devoted a great deal of space within their texts, therefore, to the benefits of movement and descriptions of exercise (*Übungen*) and physical strengthening and training programmes that they called *Gymnastik*.

Gender and the new physical education

In their proposals for physical education and gymnastics, the Philanthropinists offered biting criticism of contemporary methods of child rearing and schooling. They argued that the physical upbringing of the youth was marked by an unnatural softness (*Weichlichkeit*). In countless texts, they outlined ways in which a soft lifestyle leads to the physical degeneration of the youth. *Weichlichkeit* encompassed a number of interconnected ideas. The Philanthropinists used this term to describe the physically degenerative effects of luxury, material comfort, over-refinement, sedentary lifestyles and mental work or intellectual pursuits. They also used it to condemn the idea of spoiling or coddling the child. The Philanthropinists argued that parents were increasingly raising their children in soft or luxurious conditions and hence

were hindering the natural hardening processes that would toughen the body. With disdain, they described parents tucking children into soft feather beds, feeding them luxurious and spicy foods, keeping them indoors in heated rooms, dressing them in elaborate fashions and encouraging them to sit still indoors on sofas.

All of the Philanthropinists agreed that modern schooling, focused solely on the intellect and neglected the body, contributed to the problem of *Weichlichkeit*. They portrayed the classroom as unhealthy, emphasising the extent to which it reproduced the soft conditions of the domestic sphere. The Philanthropinists warned of the consequences of locking children indoors in hot, stuffy rooms and forcing them to sit still for hours bent over their books. School youth were deprived of the hardening effects of exposure to fresh air, movement and exercise. It was no wonder, they argued, that school children became sluggish, weak and sickly creatures. Drawing on the contemporary medical literature on the ill health of scholars by Tissot (1768) and Ackermann (1777), they also outlined the deleterious effects of intensive intellectual activity on the body of the child. Given the conditions in the classroom and the schools, Peter Villaume asked, "do we really have to wonder about the weakness of the human race?" (1787, pp. 20–21).

To counter the effects of *Weichlichkeit*, Basedow, Villaume, Gutsmuths and others proposed a series of reforms that they argued were grounded in the principles of nature and reason. Their proposals reflect a strong faith in the idea of a rational regulation of the body and preventative measures to maintain a healthy, strong, physical constitution. The concept of *Abhartung* or physical hardening was central to their programme. They called for a more rugged, natural upbringing to toughen the body. They recommended that parents subject their children to an ascetic dietary regimen, including cold bathing, simple foods and drink, hard sleeping surfaces, unrestrictive clothing, exposure to the elements and physical movement. Finally, gymnastics exercises were necessary to give the body strength, firmness and dexterity.

Gendered language and imagery were central to the literature on the new physical education and gymnastics. An opposition between feminine softness and manliness was at the heart of this discourse. The Philanthropinists set up gendered contrasts between a weak, soft, pampered upbringing and the rugged and more natural programme that they were proposing. The terms *Weichlichkeit* and *Verweichlichung* invoked images of feminine softness, weakness and sensitivity.[5] Many of the Philanthropinists also used more explicitly gendered language, employing words like "feminine" and "effeminate" to describe softness in child rearing and schooling and the weaklings that it produced.

Johann Christian Gutsmuths used female imagery to convey the idea of physical degeneration and decline. His book *Gymnastics for Young People*, whose publication in 1793 brought widespread fame to the new gymnastics, is saturated with gendered language. To generate a sense of urgency regarding the problem of *Weichlichkeit*, he described men who were becoming as soft, weak and timid as women, plagued with feminine ailments. Gutsmuths painted a

vivid portrait of what might happen to men of the upper ranks if they no longer tried to follow their natural drives for physical activity:

> our distinguished men would soon become distinguished women; we would only see them at the dressing table, the drawing board, or at the piano. The constant female society of sisters, aunts, cousins, chambermaids, and girls, in which our distinguished boys grow up, rubs off like make-up, they soon adopt the most refined tone, begin to fear spiders and monsters, get cramps, sensitivity, vapors … and become used to an overly tender care of the body and health, which is in no way fitting for a man.
>
> (Gutsmiths, 1793, p. 13)

His scenario describes a world turned upside down, in which men have lost their manly strength and courage. Trying again to raise concern about *Weichlichkeit*, he stressed that any nation who wished to make claim to manliness must banish feminine softness from the education of the youth. Gutsmuths and others were clearly anxious about the idea that the softness of women might rub off on men. Gutsmuths explained that

> it [is bound to happen] that the exaggerated tenderness of the female sex transfers easily to the young male. He is the natural lover of this sex and models himself so easily and gladly after her, if the opportunity is there in their upbringing.
>
> (1793, pp. 13–14)

Stuve was so concerned about the idea of feminisation that he warned widows not to try and raise their sons alone (1781).

The Philanthropinists were explicit about their attempt to restore manliness and masculine virtues to the next generation. *Weichlichkeit* destroyed not only health, strength and firmness of the body, traits deemed specifically masculine, but also the foundations of masculine character. Weak, sickly, plagued by sensuality, obsessed with physical comfort, men were no longer capable of demonstrating courage and firmness of character. By disciplining the body, building health, strength, dexterity and a mastery over his physical desires and capacities, a man could achieve presence of mind, independence, courage, will power and resolve. Gutsmuths explained the connection between physical hardening and training and masculine character:

> Let us *harden* the body, and it will maintain endurance and strength of nerves; let us *exercise* it, so that it can become powerful and active, then it will enliven the mind, and make one manly, powerful, unremitting, resolute, and courageous.
>
> (Gutsmuths, 1793, p. 86)

The ultimate goal was to achieve a level of physical perfection through which one could unify "health with manly strength and firmness, endurance, courage, and presence of mind" (Gutsmuths, 1793, p. 85).

While Basedow, Campe, Villaume and Gutsmuths all claimed that improved health and enhanced strength were essential for both sexes, they pointed out that boys and young men had a special responsibility to train their bodies to build manly character (Figure 7.2).

Only then would they become protectors of their families, productive members of society and sacrificing, patriotic citizens. Prescribing a series of "exercises for future manhood," including a programme to harden the body, teach self-reliance and build strength, dexterity and courage, Basedow explained that



Figure 7.2 Illustration from J.C.F. Gutsmuths' *Gymnastik für die Jugend* (1793). Courtesy of the Wellcome Collection.

"only in this way can we raise real men. My schooling and teachers did not teach me to become a man, but I hope that there will once again be men in the future" (1774, pp. 35–37).

Despite the emphasis on the effects of *Weichlichkeit* on masculine character, the Philanthropinists did not leave girls out of the new physical education altogether. Ironically, the discussion of restoring masculine attributes to the next generation opened up space for reforming the physical upbringing of girls and young women. The Philanthropinists envisioned a new physical culture for women that emphasised health, strength and natural beauty. They were very concerned with the weakness of women, especially as it affected their ability to bear strong children and raise manly men. Many argued that women passed their weakness on to the next generation and that physical hardening then must begin with the body of the mother. Girls were to be raised in a hardier manner so that as women they could withstand the pains of childbirth and become capable housewives and mothers. Promoting an ideal of natural, simple feminine beauty, they condemned unnatural and unhealthy fashions, like the corset. At the same time, they asked parents to include girls in the dietary programme of physical hardening and encourage them to practice more movement and exercise.

While the Philanthropinists agreed that women should develop a greater degree of strength, they were clearly uneasy with the idea of strong women and the threat that they might pose to the natural, harmonious gender order. Clearly, they did not want to negate sex difference in the body or do away with the idea of the weaker sex. They sought to limit the degree of strength that girls and young women were to achieve. In *The Method Book*, Basedow claimed that women did not need as much strength as men. Both nature and society intended for women to be the weaker sex. It was natural and proper that the body, physical appearance, and movements announce sex difference. So while men must develop manly strength, women should focus on cultivating a pleasing, graceful feminine demeanour (Basedow, 1770, pp. 138–65). He sought a balance between extreme feminine softness and manly strength for women:

> From the exaggerated softness of the female sex comes the harmful weakness of ours. Women are not allowed to be as strong as men, but [they must be] strong for them, so that they may bear strong men.
>
> (Basedow, 1770, p. 141)

In his book *Fatherly Advice for My Daughter* (1789), Campe told his fictive daughter to develop a hardy physical constitution. Yet, he warned that women should not step beyond the feminine sphere and take up manly physical exercises and training. This was not the way to achieve a woman's true calling as wife, mother and housekeeper (Campe, 1789, pp. 10–12). None of the Philanthropinists recommended that girls participate in intensive and formal physical training. Rather, they suggested that domestic labour, walks and graceful sports like badminton and ice skating would be enough for girls and

young women (Basedow, 1770, pp. 138–165; Villaume, 1780, pp. 354–410; Campe, 1789, pp. 20–27; André, 1789; Gutsmuths, 1804, pp. 508–510).

In general, the Philanthropinists focused primarily on issues of health when talking about a new physical education and culture for women. *Weichlichkeit* did not appear to endanger female character. In fact, they reinforced images of femininity associated with gentleness, sensitivity, willingness to yield, dependence on others, timidity and lack of courage. They even suggested that intensive physical training for women might work against natural relations between the sexes. Basedow, Campe and Villaume all argued that the opposition between strength and weakness was at the heart of the bond uniting the sexes. It was a man's strength in body and mind that attracted the weaker and less capable woman. Invoking the image of the oak tree and clinging vine, Campe portrayed the relationship between the sexes as one of strength and protection, on the one hand, and dependence and loyalty on the other (1789, p. 21). He agreed with others, therefore, that the physical upbringing of the youth should be in accordance with this simple law of nature and should reinforce sex difference in body and character.

Civilisation and its discontents: *Weichlichkeit* and the feminisation of "modern," "civilised" Germans

The discussion of *Weichlichkeit* in the physical upbringing of the youth was grounded in a cultural critique of the age. The Philanthropinists increasingly saw the eighteenth century as not only an age of Enlightenment but also of softness and weakness. Drawing on the writings of the famous philosopher Rousseau, they focused attention on the darker side of the civilising process. As a subtext to the critique of child rearing practices, they told the story of the physical degeneration and, hence, feminisation of "modern" Germans. Comparisons between "civilised" Germans and other peoples from both the past and present played a key role in constructing this narrative. The Philanthropinists pointed to the health and physical prowess of the ancients and "primitive" peoples across the globe. With awe, they described the strength and manliness of the Greek youth working out at the gymnasium or the native American Indian, the epitome of the contemporary noble savage, making his way across the wilderness. They also made frequent references to the hardy physical constitution of the ancient Germans. Citing Tacitus, they claimed that Germans were naturally strong, vigorous, courageous and manly. In all these cases, they attributed the strength and manly character of these peoples to their natural, hardy upbringing. Living close to nature or in harmony with its principles, the Greeks, ancient Germans and "primitive" peoples toughened their bodies through exposure to the elements, simple living and physical exertion. The physical culture and strength of these peoples served as evidence of the advantages of the natural principles of *Abhartung*.

The Philanthropinists did not fail to point out that physical strength and training were important attributes for warrior societies. They often noted that

the gymnastics fields of the Greeks produced not only strong scholars and athletes but also patriotic and heroic citizen-soldiers. They drew attention to the importance of physical hardening for development of heroic virtues like courage and the capacity for bold, principled and patriotic action. The hero's body became a symbol of all that the new physical education stood for. The Spartan warrior and ancient Germanic hero trained his body and overcame both the slavishness of sensuality and physical pain. He was capable of sacrificing himself and using his body as a tool in a struggle for a higher cause.

Compared to the ancients and "primitive" peoples, "civilised" Germans appeared particularly soft and weak. Bemoaning the fact that modern Germans were only shadows of what their ancient ancestors had been, Gutsmuths described a scenario in which parents tell their children about their "forefathers":

> We appear stiller and quieter than our ancient forefathers. We recognise that they are lively 'natural men,' whose physical strength is superior to ours, but they are people like us. We show our children their picture. They are pleased by these quick and lively German men, their courage, their strength and hardness. They ask us: why are we not like this?
>
> (Gutsmuths, 1793, p. 3)

Gutsmuths and others argued that physical degeneration was not an accident of nature but rather a direct result of the civilising process and modernity. Stuve explained that "refined and civilised people lost physical strength and dexterity as they gained intellectual and cultural refinement" (1785, p. 272). "People of this age are weaker and softer than their forefathers," Stuve declared, "so you need to work with greater energy today to ensure that children stay healthy and strong" (1781, p. 7). The Philanthropinists argued that luxury, material comforts, refinement, sedentary occupations and increased intellectual pursuits were markers of the modern age and the root causes of the weakness and ill health of modern, civilised Germans. They also pointed to the separation between the military and civil society as another factor contributing to physical decline. They claimed that standing armies had replaced citizen armies, and hence most modern Germans were no longer required to be fierce warriors and strong men.

The discussion of *Weichlichkeit* was grounded in a socially specific analysis. In the eighteenth century, civility, refinement, conspicuous consumption, leisure, education and non-physical labour were factors that marked social difference, marking boundaries not only between Europeans and "primitive" peoples but also between the upper and lower ranks in Germany. The Philanthropinists made it clear, therefore, that their programme was directed primarily towards the soft upper and educated classes. An urban/rural opposition also lay behind this discourse. Cities and towns, the centres of civilisation and refinement, were the seats of weakness, softness and ill health. Idealised images of rugged, vigorous peasants who had retained elements of the natural lifestyle and physical constitution of their ancient ancestors abound in these texts.

While some like Campe offered biting critiques of the court and high society or *grosse Welt*, none of the Philanthropists limited their discussion to the nobility. They all agreed that *Weichlichkeit* affected other wealthy, educated elites, or all those who shared to some degree the attributes of modern, civilised humanity, especially those of the cities. They focused attention, for example, on the problem of education and the intellectualism of the age. They were very concerned with the softening and feminising effects of study, intense reflection and scholarship. None of these men questioned the association between manliness, rationality and scholarship. While emphasising that women, for reasons of health, should not engage in scholarship or authorship, Campe explained that men were the strong sex in both body and mind. Nature gave men a greater capacity for reason and abstract thought. A man's stronger physical constitution, moreover, enabled him to withstand the physical strains of intellectual activity and scholarship. Yet, Campe and other Philanthropinists were concerned that intellectualism and the unhealthy life of the scholar threatened masculine strength and character (Campe, 1789, pp. 50–55). Next to the image of the dandy, the scholar emerged as a symbol of the softness, weakness and effeminacy of the age.

The Philanthropinists expressed scepticism about the idea of progress. Like Rousseau, they began to question the gains that civilisation had made with the move out of the state of nature into civilised society. Focusing on the problem of *Weichlichkeit*, they drew attention to perceived negative consequences of the civilising process in Germany. Cultural and intellectual refinement threatened to destroy some of the key elements of masculine character embodied in the ideal of rugged and heroic manliness. They argued that in an age in which so many had left the principles of nature behind, strong bodies, a masculine physique and heroic character would not simply emerge on their own. A programme of physical hardening and training was needed to counterbalance the weakness and softness of the age. "There is an art of building the body," Villaume explained, "and this art is necessary, not in Kamtchatka, in Senegal and Oronoko but in Europe, in Germany" (1787, p. 38).

At the heart of this discourse was an effort to rework the cultural understanding of refinement. The Philanthropinists tried to break what they saw as a contemporary association between savagery and strength. They made it clear that they understood the value of culture and were not promoting a return to the state of nature. Yet, they insisted that physical strength should be an attribute of the truly cultivated man. Gutsmuths (1793) assured his readers that the new physical education did not represent a return to the wild roughness of the ancient Germans. He maintained that it is possible to unite physical strength, manliness and culture:

> Your ideal cannot and should not be rough *Germanic savagery*; but rather a unity of *Germanic physical firmness and strength*, *courage and manliness and a cultivation of the heart and mind*. For the *former* you would need Germanic forests, rude ignorance, a nomadic life without culture, without grace or

> muses, the barbaric right of the strongest; for the *latter*, something that can be combined with the culture of your intellect with pleasant harmony; *the development and training of your physical capacities, manly aversion to effeminate softness*.
>
> (Gutsmuths, 1793, p. 41)

Gutsmuths captured the sentiments of his contemporaries when he explained that he sought to fuse the positive elements of the different sides of man. "If we unify the physical perfection of natural man with the intellectual cultivation of the civilised, we will see the most beautiful ideal of our race, an ideal which sends our hearts racing" (Gutsmuths, 1793, p. 117). The new physical education and gymnastics emerged as a means of reaching this ideal and achieving a balance between nature/culture and body/mind. The Philanthropinists looked to the ancient Greeks and their physical training programme as the model to unite culture, strength and manliness.

The Philanthropinists were inspired by and drew on medical texts from across Europe. It is not surprising, therefore, that the discourse on soft/weak/feminine vs. hardy, strong, masculine and concern for manly traits for the upper and middle ranks in the Philanthropinists' texts can also be found in medical texts on healthy living produced in the late seventeenth and eighteenth centuries in England and France (Williams, 2003; Jenner, 2007; Kennaway, 2016). As Kennaway explains, the theme of the ill health of scholars had long been part of the international medical discourse on the non-naturals and exercise. The culture of sensibility that emerged in the eighteenth century added new meaning to and intensified concerns about the dangers and gendered elements of sedentary lifestyles and reading (Kennaway, 2016). Like their counterparts in England, France and Switzerland, the Philanthropinists warned that women of the upper ranks were adding to their natural weakness by reading novels that distracted them from domestic duties and strained their nerves and inflamed the passions. They used the counter image of the monastic scholar (isolated, idle and feeble) to construct their ideal man of culture as socially engaged, active and strong enough to participate in civil society. The Philanthropinists wrote primarily for a German-speaking audience, however, and saw themselves as not simply world citizens (*Weltbürger*) but also part of an educated public sphere of German speakers, a cultural nation that stretched across state boundaries. In order to create a sense of urgency and shame, they drew specifically on Germanic imagery and references to ancient Germans (Tacitus) that had long been a part of the discourse of Germanness in Central Europe. They helped construct a culturally specific narrative about Germans, gender, manliness and degeneration in the modern age.

The Philanthropinists not only wrote about the need for manly exercise and physical training, they put their ideas into practice and their schools. Their practical institutional work and publicity seems to set them apart from other proponents of healthy living, physical education and gymnastics in England,

France and Switzerland in this period.[6] They were skilled self-promoters and opened their schools to visitors from across the German states and Europe. Their schools in Dessau and Schnepfenthal gained notoriety not simply in the German states but across Europe as models of Enlightened reform (Sanislo, 2001). Gutsmuths' text on gymnastics was reprinted and translated into multiple languages. Salzmann's school in Schnepfenthal and Gutsmuths' work there continued to inspire advocates of healthy living, exercise and gymnastics in Germany and across Europe in the nineteenth century. The Philanthropinist practical work in the schools and publicity efforts may help to explain why they eventually became known as the "founding fathers" of physical education and gymnastics among early sport historians (Van Dalen et al., 1953; Saubier, 1961; Hackensmith, 1966; Überhorst, 1978).

Conclusion

An analysis of the work of the Philanthropinists highlights the ways in which the non-naturals were employed to construct gender identities and social status in the late eighteenth century. Recent work on the history of medicine, the non-naturals and gender in the early modern period shows that similar dynamics to define gender-appropriate movement and exercise were evident in other contexts and time periods. Sandra Cavallo and Tessa Storey's research on preventative medicine in Renaissance Italy, for example, points out the ways that advise about gender-appropriate movement intersected with early modern notions of gendered temperament and an emerging aristocratic image of the genteel elite man (Cavallo and Storey, 2016). The Italian health manuals from this period stressed the dangers of exercise that was too vigorous and unbecoming of a refined gentleman. The hunt and concerns about how vigorous it could be emerged as a flashpoint for differing, contrasting images of masculinity. The Philanthropinists literature shared similarities and differences with advocates of healthy living who came before them. Like Italians in the Renaissance, the Philanthropinists stressed the need for moderation and balance. They recognised that there were culturally specific levels of the intensity of exercise and said that they did not want European men of the upper and educated middle ranks to become too primitive. Although violent, rough boxing was acceptable for the ancients and more primitive peoples, moderate wrestling was a more appropriate version of tests of strength for their own time. Although they called for a degree of moderation, compared to the authors in the Italian Renaissance, they appeared to tip the balance away from rest and towards motion. They expressed more concern about softness, weakness and effeminacy than caution about overly vigorous exercises. Their discourse on this theme was informed by their larger cultural critique of the age and anxiety about the manliness of the upper ranks, especially the educated middle-class man.

The Philanthropinists' discourse on gender, physical education and gymnastics prompts a reinterpretation of the standard assumptions about gender in the

eighteenth century. Feminist historians often point to a series of gendered oppositions (male/female, active/passive, rational/emotional, mind/body, culture/nature) as central to gender relations in the late eighteenth and early nineteenth centuries (Ortner, 1974; Duden, 1977; MacCormack and Strathern, 1980; Hausen, 1981; Merchant, 1982; Frevert, 1988; Jordanova, 1989; Schiebinger, 1989; Honegger, 1991; Outram, 1995). Feminist historians and political theorists argued that masculine characteristics came to be privileged in the newly emerging public sphere and politics. Within the Philanthropinists' texts, however, many of these gendered cultural codes were reversed. Nature, the body and primitive humanity were associated with manliness or rugged, heroic masculinity. Femininity and effeminacy, on the other hand, were linked with civility, cultural refinement, intellectualism and civilisation. An analysis of their discourse on physical education suggests that it is important to recognise the multiple ways that gendered oppositions and meanings can be configured in a given historical context. The Philanthropinists underscored the unstable or problematic nature of masculinity and masculine character. The Philanthropinists argued that manliness was not inherent but rather had to be built. More importantly, they emphasised the problematic nature of masculinity in the modern age, the tensions between different sides of man and the need to balance and reconcile them.

An analysis of the gendered language and imagery in their texts suggests that the idea of gymnastics and its urgency for young men emerged out of concern over divergent elements of masculinity. On the one hand stands the man of strength, vigour, will power and courage and, on the other hand, the civilised man, a rational, intellectual and culturally refined being. One might argue that these two sides of man are not necessarily contradictory or in tension with one another. Yet, in the late eighteenth century, the Philanthropinists came to see them as such. At least, they came to regard them as something that needed to be reconciled, balanced or managed. They argued that intervention was needed to build manly men and prepare boys and young men for their future roles in civil society.

An analysis of the work of the Philanthropinists draws attention to the connections between the interplay of gender ideals and practice. Early feminist scholarship on the character of the sexes and male/female embodiment at the turn of the eighteenth century in Germany focused heavily on the formulation of and spread of gender ideals and gender ideologies (Hausen, 1981; Frevert, 1988; Honegger, 1991). More recent research in late eighteenth- and early nineteenth-century German gender history explores in greater detail the ways in which gender identities and relations are constructed in practice. Anne-Charlott Trepp's pathbreaking research on gender relations among men and women of the new middle class in Hamburg, for example, demonstrates that an analysis of the dominant gender ideologies of the period does not fully explain the range of options for the formulation of gender identities in practice (1996). Her study reveals that men and women formulated alternative identities and practices that were very much in tension with the dominant gender ideals of the period. Her work suggests that historians need to go beyond a discussion of

the ideology of the "character of the sexes" to understand the complexities of gender relations in this period. However, her book did not explore the tension that her historical subjects might have felt in relation to contemporary gender ideals. Trepp leaves the impression that individuals in this period operated almost independently of the dominant gender codes.

The work of the Philanthropinists illustrates the need to explore the formulation of gender ideals, the tensions around them and the efforts to maintain the "natural" gender order in practice. In this instance, educated middle-class men grappled with the tensions between the gender ideals that they propagated and the "real" male and female bodies that they encountered. Enlightened reformers recognised that not all bodies conformed to the "principles of nature." Rather than denying the idea of natural differences, they proclaimed their age to be "unnatural" and designed new programmes aimed at restoring and maintaining what they deemed to be the natural gender order.

The trend towards valuing the training of the body and emphasising its importance for gender relations continued and intensified in the German states in the early nineteenth century. The problem that the Philanthropinists defined haunted the imagination of a growing number of educated men in the nineteenth century.[7] Against the background of the Napoleonic wars, concerns about the civilising process, physical degeneration and manliness became more widespread and intense. Increasingly, Prussian patriots and early German nationalists put their hopes for a victory over the French in the notion of "the nation in arms." Their propaganda, designed to stir patriotic sentiment and sacrifice, along with the King of Prussia's call to arms in 1813, put heroic manliness at the centre of the "liberation" project (Pape, 1994; Kaulbuch, 1994; Hagemann, 1997a, 1997b, 2002; Frevert, 1996; Sanislo, 2001). In this context, a growing number of educators, patriots, military leaders and public officials began to promote the new gymnastics as a training ground for manly citizen-soldiers and a cradle of patriotic sentiment. Between 1810 and 1819, they founded a series of new gymnastic societies across the German territories.

As the discourse on gymnastics became more overtly nationalistic and militaristic, the links between physical education, physical training and manliness were tightened even further. National independence appeared to rest, in part, upon training the male body, protecting masculine character and cultivating patriotic bonds among men. The concern for stronger female bodies, which was so significant in the texts of the Philanthropinists, now faded. The leaders of the new gymnastics movement no longer raised the patriotic significance of hardening and strengthening female bodies for motherhood. At the same time, repressing images of strong, warrior women that circulated during and after the wars, they ignored or rejected the possibility of training female "defenders of the fatherland." Excluding women from the new gymnastic societies and fields, they began to construct a purely masculine patriotic space, one which would eventually come to play a large role in the German national movement and political culture of the nineteenth century (McMillian, 1996).

Notes

1 Johann Peter Frank is considered to be one of the founding fathers of public health in Central Europe, and he was quite familiar with Tissot and his work. Frank replaced Tissot in Pavia, corresponded with him in the 1770s, and eventually visited Tissot in Lausanne in 1791 (Emch-Dériaz, 1992, p. 157).
2 For an introduction to the discourse on health, physical education and exercise in eighteenth-century England, France and Switzerland, see Park (1976).
3 For a detailed history of the Philanthropinist movement and their physical education programmes, see Sanislo (2001).
4 Christian Carl André started a Philanthropinist school in Arolsen in 1782. He worked at Salzmann's school in Schnepfental during 1785–1790 and then left to set up his own Philanthropinist school for girls. Peter Villaume worked as a teacher at a gymnasium in Berlin, met Campe and contributed to the Philanthropinist journals. He became a tutor on a noble estate in Denmark in 1793 and founded his own Philanthropinist school there in 1794.
5 Historians of science, gender and the body frequently point out that physicians and natural philosophers often used the language of softness and sensitivity to describe the "female organism" (Jordanova, 1989, p. 28; Schiebinger, 1989, pp. 214–224; Honegger, 1991, pp. 126–199).
6 Park discusses the growth in medical and pedagogical literature in the vernacular on healthy living, physical education and exercise in the late eighteenth century but notes that few in England, France or Switzerland tried to put their ideals into practice in a school setting. She and Purnell point to Jean Verdier, a French doctor, who opened a school to put his ideas into practice about healthy, exercise and the importance of training the senses for a moral education, as an exception (Park and Purnell, 2013). Verdier's school was only open from 1773 to 1787, however. The differing political contexts and educational systems in various European states might have played a role in the extent to which ideas based on the movement for medical enlightenment were integrated into school administration and practice. The Philanthropinists in the German states found multiple dukes and noblemen who politically and financially supported their work.
7 For a detailed analysis of the politics of gender, the body, physical training, patriotism and nationalism at the turn of the nineteenth century in Germany, see Sanislo (2001). For a broader European-wide analysis tracing the discourse on masculinity, civilisation and the body in the modern period, see Forth (2008).

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Part 4

Sleep and wakefulness



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8 "That venerable and princely custom of long-lying abed"

Sleep and civility in seventeenth- and eighteenth-century urban society[1]

Elizabeth Hunter

"Early to bed and early to rise, and you never meet any prominent people." This ironic twist on a familiar English proverb was attributed to the American writer George Ade in 1928 (Miner and Rawson, 2006, p. 307); but it would have been appreciated in eighteenth-century London where the upper classes and their imitators gained notoriety for excess and late-night revels. A certain degree of night-time socialising was necessary for the purposes of business and social advancement, and it also formed part of an Enlightenment ideal of a cultured and connected society. The excessive pursuit of leisure during the hours of darkness, however, and the period of sleeping during morning hours that inevitably followed, were seen by some as ruinous to the health of the individual and nation. This was not an entirely new concern. As one of the six non-naturals, attention to hours of sleeping and waking was well established in European culture as a way of maintaining health and living to an old age. However, in the midst of anxiety that the old rhythms of day and night were being eroded, popular health manuals, such as those of the famous physician George Cheyne, insisted upon the unnaturalness and unhealthiness of late-night entertainment more strongly than in previous centuries.

This chapter explores how these health concerns became interwoven with debates about proper conduct and masculine identity. Historians of gender and culture have identified the long eighteenth century as a period in which modern concepts of politeness, civility, masculinity and the identity of the "gentleman" were being developed. In particular, a number of historians have detected in this period a shift in the concept of genteel masculinity. Whereas in previous centuries landownership was crucial to a gentleman's identity, the seventeenth and eighteenth centuries saw the emergence of the bourgeois gentleman, who made a living through trade, or the professions, and whose claim to gentlemanly status was based in the respectability of his social interactions and domestic arrangements (Bryson, 1998; Harvey, 2005, pp. 296–311; Tosh, 2014, pp. 219–220). Sleeping habits became a defining factor, distinguishing the "beau" and the "rake" from the "man of business." For some, maintaining a position in urban society, while also remaining healthy and avoiding dissolute company, was a difficult balancing act that was not always achieved. Others deliberately flouted the advice of physicians and conduct books, revelling in the excess associated with wealth and status.

"Early to bed and early to rise"

The spiritual, material and health benefits of early rising are expressed in the English proverb "early to bed and early to rise makes a man healthy, wealthy and wise," commonly associated with the name of Benjamin Franklin. He included it in a 1735 edition of *Poor Richard's Almanac*, a pamphlet published yearly in the American colonies. He quoted it again in *The Way to Wealth*, an essay on the benefits of frugality and a strong work ethic (Franklin, 1786, p. 5; Miner and Rawson, 2006, p. 307). The proverb has therefore become associated with the American Dream – the idea that in a free society it is possible for individuals to improve their lives through diligence and innate ability, regardless of birth (Houston, 2008, pp. 3–4). This is in turn based upon Enlightenment values of liberty and the pursuit of happiness.

The saying, however, is not original to Franklin or to the Enlightenment era, but has its origins in the rhythms of rural life in medieval England and the principles of Hippocratic humoral medicine. An early version can be found in a fifteenth-century treatise on angling. The author extols the health-giving benefits of fishing, which, in addition to exposing the sportsman to good air, exercise and the harmonious environment of bird song, is the occasion for him to rise early: for "As the olde englysshe proverb sayth in this wyse. Who soo woll ryse erly shall be holy helthy and zely [fortunate]." Follow this advice, the author urges, for a long old age (*treatise of fysshynge*, 1496, sig. Hi).

Writing for those with less leisure, an early sixteenth–century book on land management, emphasises the financial wisdom behind the proverb:

> Whan thou syttest by ye fyre & hast souped consydre in thy mynde whether ye warkes yt thou thy wyfe & thy servantes shall do be more avauntage to the than ye fyre & candell lyght meat & drynk yt they shal spende … & yf it be nat than go to thy bed & slepe & be up betyme & breake thy fast before day that thou mayst be all the short wynters daye aboute thy busynes.
>
> (Fitzherbert, 1530, fol. Lii)

The modern wording can be found in books of proverbs printed in the seventeenth century, alongside similar sentiments. These included: "One houres sleepe before midnight, is worth three after" (which some collections reduce to a more moderate two); "Go to bed with the lambe, and rise with the lark"; and a now quaint-sounding couplet, which was more specific about exactly what was meant by "early" rising,

> He that will thrive must rise by five.
> He that hath thriven may lye till seven.
>
> (Clarke, 1639, pp. 91–92, 292; Herbert, 1640, no. 882; Ray, 1678, p. 38)

Health manuals from this period did not universally condemn morning sleep; it was thought necessary for the elderly and the sick, and, occasionally, might be permitted after a late night. Generally, however, the hours between sunrise and noon were considered the worst time for sleep in those who were young and healthy. Humoral theory saw the body as a microcosm reacting to changes in light and atmosphere in a way similar to plant life. Sleep during sunlight hours was not simply lazy, but unnatural. "Eschue noon sleeps, and too long morning-sleeps, as great enemies to health," advised the seventeenth-century medical treatise *The Skilful Physician*, "for whatsoever is not according to the course of Nature, is contrary to Nature, and so will by little and little weaken Nature, and in the end overthrow it" (Bahia, 1656, sig. a5). As the rays of the sun drew the blood and vital spirits to the surface of the body, the day was the natural time for work. Around midnight, when the sun was farthest from the earth, the spirits withdrew into the body, aiding digestion. If this process continued past the natural hour, the body would become dry, and badly concocted humours would rise up to the head causing headaches, rheums and fever. (see Langton, 1547, sig. Hiii; Gratarolo, 1574, pp. 75–76; Vaughan, 1600, p. 75; Paré, 1665, p. 254)

Sleep in the city

In pre-Enlightenment Europe, the wealthy urban elite had already gained a reputation for bad sleeping habits. The famous Spanish work *A Dispraise of the Life of a Courtier* (published in English in 1548) painted a picture of worldly court life in the city, where courtiers stayed up late to advance their own affairs and slept past prayer time in the morning (Guevara, 1548, sig. fiii). This was despite the efforts of civic authorities to enforce early modern ideas about the natural rhythms of sleep and rest. In London, the "shutting in of the day" (a phrase sometimes used to refer to the onset of darkness) was a literal event, which took place each night when the seven gates allowing entrance to the City were shut, and "watchmen" patrolled the streets with powers to charge on-the-spot fines for drunken behaviour. They could also arrest anyone who could not give a sufficient reason for being out after dark for the crime of "nightwalking" (Ekirch, 2005, pp. 59–84; Griffiths, 2008, ch. 9). This attempt by the authorities to shut down the City at night was not entirely successful. Historians studying the history of the metropolis have shown that there was a vibrant City night life. People of all ages, and a broad range of social classes, stayed up to drink or gamble in ale houses and taverns. Neighbours complained of noise caused by drunken people in the streets at night (Ekirch, 2005, pp. 185–190; Griffiths, 2008, pp. 332–342).

The sleeping habits and nocturnal pursuits of London's fashionable society became the subject of sharp social criticism. At the turn of the seventeenth century, Thomas Dekker painted a colourful picture of indolent urban life in his satirical work *The Gull's Hornbook* (1905), first published in 1609. Here he outlines the typical day of a "gull" or would-be "gallant" – a credulous young

man of dissipated habits who frequented fashionable places. In an early chapter entitled "Rules for the morning [and] in praise of sleep," the gull makes his first appearance in the "softest and largest down-bed" where he stays until noon (Dekker, 1905, p. 23). The chapter plays on the conflict between this decadence and medical wisdom. "Care not for those coarse painted-cloth rhymes," Dekker advises, ironically, "made by the university of Salerne, that come over you with:

> *Sit brevis aul nullis, tibi somnus meridanus*
> Short let thy sleep at noon be,
> Or rather let it none be.
>
> (Dekker, 1905, p. 23)

The couplet is taken from the well-known medieval didactic poem, *Regimen sanitatis Salernitanum* (De Mediolano, 1528), and a "painted-cloth rhyme" was a motto painted on canvases used to decorate the walls of medieval and early modern households (Mander, 1997). Dekker's reference suggests that this maxim against midday sleep was a common choice for the bedchamber. However, his Gull is derisive of these learned verses: "Physicians, I know, and none else took up the bucklers in their defence; railing bitterly upon that venerable and princely custom on long-lying-abed." He accuses physicians of a conspiracy to spoil people's pleasure and increase doctor's bills, based on the reasoning that it cannot be possible to have too much of a good thing (Dekker, 1905, p. 24) (Figure 8.1).

The *Gull's Hornbook* is evidence of social tension in London society, as the habits associated with privilege were seen to violate common ideas of decency. Over the next two centuries, this tension was complicated by the transformation of nightlife in London as part of a process that the historian Craig Koslofsky has termed "nocturnalization" (2011, pp. 14–16). On the one hand, changing attitudes rendered some forms of night-time socialising respectable, even civilised and desirable, for those who could afford it. On the other hand, wealth and fashion became even more closely associated with unhealthy lifestyles.

Nocturnalisation was a process by which activities that had previously belonged by common agreement to daylight hours (such as leisure, entertainment, religion and politics) were extended into the night. This gained legitimacy owing to a change of mindset regarding how to police night-time movements that occurred around the mid-seventeenth century. Rather than shutting down neighbourhoods completely, the authorities turned their attention to proposals to make the hours of darkness safer and public interactions more civilised. The marks of this transformation could be seen in the City's nightscape. European cities were quite literally "enlightened." The first publicly funded street lighting appeared in London between 1684 and 1694, enabled by improvements in lantern design. Coffee houses, theatres, opera houses, assembly rooms, the new banqueting hall at Whitehall, and the pleasure gardens at Vauxhall and Renelagh were lit up at night. Nocturnalisation also

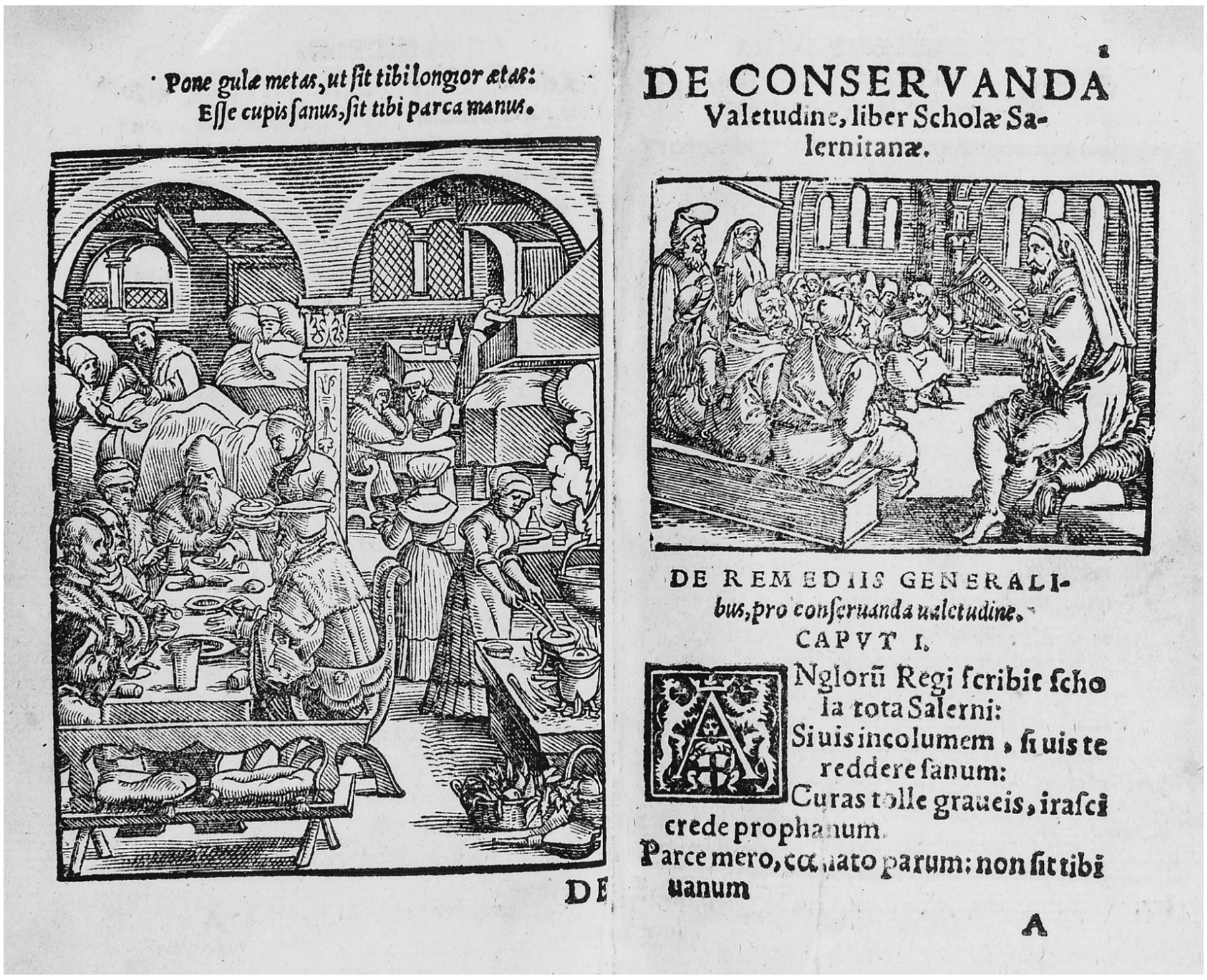


Figure 8.1 Woodcut, frontispiece and first page from the *Regimen sanitatis Salernitanum* (1553). Courtesy of the Wellcome Collection.

affected the functioning of wealthy households, which acquired new bedding to accommodate guests and chairs designed for daytime naps. Sitting up socialising and playing cards became fashionable in well-to-do houses in both the country and the city (Koslofsky, 2011; Handley, 2016, pp. 163–173).

The relationship of the Enlightenment to this process is complex. Public urban spaces were a vital element in the spread of Enlightenment ideas and the culture of politeness, enabling the conditions of open market and free mixing of social classes in which a society intent on consuming new ideas could flourish. In particular, coffee houses, notorious for their late opening times, provided reading material such as newspapers and periodicals, like the *Tatler* and the *Spectator*, as well as a meeting place for various clubs, making them a venue for the discussion of issues of government and civic virtue. During the eighteenth century, London was seen as a model for the progressive mix of people of varying ranks, sex and religious affiliations, which could be seen in resorts such as Vauxhall (Porter, 1981, pp. 11–13; Koslofsky, 2011, pp. 151–162; Outram, 2013, pp. 15–16). A number of Enlightenment philosophers, notably David Hume and Adam Smith, saw the moderate use of night hours for socialising as having multiple civic benefits. Gatherings of elite society strengthened

commercial ties, advanced knowledge in the arts and sciences, improved manners and enhanced human feeling (Handley, 2016, pp. 163–164).

Sleep and the pursuit of happiness

Concurrent with this civic ideal, there was an alternative Enlightenment view of sleep – one which idealised nature and rural life, encouraging the wealthy elite to eschew the artifice associated with luxury and indolence and turn to "natural" habits of sleeping, exercise and diet. Echoing the treatise on fishing written for a gentry readership two centuries earlier, John Locke's highly influential essay *Some Thoughts Concerning Education*, first published in 1693, advocated fresh air and early rising as the staples of a young gentleman's upbringing:

> He that, from his Childhood, has, by a setled Custom, made *Rising betimes* [before the expected time; early] easie and familiar to him, will not, when he is a Man, waste the best and most useful Part of his Life in Drowziness and Lying a-bed. If Children therefore are to be called up early in the Morning, it will follow of Course, that they must go to Bed betimes; whereby they will be accustomed to avoid the unhealthy and unsafe Hours of Debauchery, which are those of the Evenings: And they who keep good Hours, seldom are guilty of any great Disorders.
>
> (Locke, 1695, §21)

The author of the treatise on fishing believed that early rising prolonged life, and Dekker had seen the gull's disordered sleeping habits as an offence against decency. For Locke, the ultimate purpose of good habits was not to please society, or even to live to an old age, but to further the pursuit of liberty and happiness. Health was a necessity to happiness, as it was understood by Locke. He summed up his definition of happiness in the opening sentence of *Some Thoughts*: "A Sound Mind in a sound Body, is a short, but full Description of a Happy State in this World" (Locke, 1695, §1). Liberty denoted independence, self-reliance and the ability to manage one's own affairs. This was not a self-indulgent freedom. Luxuries and inherited wealth were a threat to liberty when they impeded the development of self-reliance and robust health. Locke therefore advised parents not to be overly protective of their children but to bring them up in a similar manner to the sons of farmers, allowing them few comforts, and freedom to roam outdoors. He even suggested giving them shoes that let in water (Locke, 1695, §4–9; Tarcov, 1984, pp. 77–86).

Underlying this advice was a belief in the plasticity of the human constitution. Reflecting on the physiological differences found between Europeans and the inhabitants of newly discovered territories, a number of thinkers drew the conclusion that environment was the key factor. Locke reasoned that if the indigenous peoples of hot countries were able to endure the sun because they allowed their children to go naked, then English children were less likely

to become ill if they had become acclimatised to cold and damp weather from an early age (Locke, 1695, §5). This was partly related to an idealised Enlightenment concept of the "natural" man who exists in a more innocent state, liberated from the corrupting effects of civic life and the pursuit of luxury (Outram, 2013, pp. 58–62). Locke regarded artificial environments as having a degenerating and effeminising effect upon the constitution. He framed good health in masculine terms. A strong constitution produced the "man of business" and the soldier, whereas anything "soft" or "feminine" spoiled a child's health (Locke, 1695, §4, 9, 15, 21).

This concern with environment extended to the sleeping environment. Locke disapproved of feather mattresses. A soft mattress, he claimed, "melts and dissolves the body" (Locke, 1695, §22). Here it is likely that he was influenced by the controversial writings of the Behmenist Thomas Tryon, who compared sleeping in an old feather bed to burying one's face in a privy. Tryon promoted vegetarianism and an ascetic lifestyle, believing that many of the "hot" luxuries enjoyed by the upper classes such as meat, alcohol, tobacco, large fires and soft beds were debilitating. Amongst the perils of feather beds, upon which he elaborated, were the retention of sweat, bodily odours and diseases passed on by former (dead) occupants, the harbouring of excrement and parasites, the overheating of the back and kidneys and a general faintness caused by drying out of the bodily fluids. He recommended instead sleeping on straw pallets covered with flock (rag stuffed) or wool quilts, which were common in less well-off households or reserved for servants and children in wealthy households (Handley, 2016, pp. 124–126). In humoral terms, the aim of Tryon's "clean" health regimen was to keep the body cool through the avoidance of "hot" food and the free access of fresh air, even at night (Tryon, 1682; Smith, 2004).

Locke applied these ideas of health, based on ancient humoral medicine, to a new agenda – that of promoting reason and natural freedom as the basis of self-government. To this end, he made an exception to the general rule of retiring at 8 o'clock, which was that older sons should be allowed occasionally to stay up until midnight to share a glass of wine with company. This exception exposed a contradiction inherent in Locke's programme of education. Whereas he advised a health regimen based in conditioning children to be comfortable in nature and the outdoors, the development of reason and enlightened thought was based upon the sociability of an artificial, urban environment that increasingly ignored the natural patterns of night and day. Locke attempted to resolve this conundrum by making a distinction between civil and uncivil night-time socialising, between "midnight revels" and a late-night "chat" (Locke, 1695, §21).

Husbanding time

While Locke addressed his *Thoughts on Education* to the landed elite, he intended the principles to be universally applicable. If education rather than birth was the key to liberty, the pursuit of happiness was open to all. For those without

inherited fortunes, however, wealth-management rather than health tended to be the dominant motivation put forward in favour of early rising. Texts on estate management emphasised the importance of making good use of time and avoiding expensive habits and company. Early bedtimes and early mornings were part of an economy that promised wealth and independence to men who followed the principles of temperance, frugality, industry and sobriety.

By the eighteenth century, this principle of economy was being taught to those who aspired to make their fortunes through trade in a genre of educational handbooks Lawrence Klein has labelled "Very Useful Manuals" (1995, pp. 362–380). Earlier in this chapter, we came across the concept of early rising as a rule of household management in Fitzherbert's book on husbandry. This theme continued in Very Useful Manuals aimed at a City, rather than a rural, audience, which laid stress on the importance of "husbanding time." "Above all Things learn to put a due Value on Time," wrote John Barnard in *A Present for an Apprentice*, "and husband every Moment, as if it were to be your last: In Time, is comprehended all we possess, enjoy, or wish for; and in losing that, we lose them all" (1740, p. 25). Here the verb "to husband" was used in the sense of "to manage to best advantage," but the concept was closely connected to the role of a husband as the manager of the family assets.

In this way, trading guides stressed the business sense of proverbs such as "early to bed …" and "one hour's sleep before midnight … ." As with considerations of health, this had its basis in custom. Traditionally, daytime in urban areas was associated with work and profit. Many medieval guilds had outlawed night-time activities. In particular, trade during the hours of darkness was associated with deception as bad lighting made it difficult to assess the value of goods being sold. In London, the ban on a number of trades continued into the early modern period because of the noise made at night. Smiths, pewterers and founders, for instance, were subject to a fine if heard working between the hours of curfew and 4 o'clock in the morning (Ekirch, 2005, pp. 155–157; Griffiths, 2008, pp. 39–40). The underlying principle was that citizens required quiet and rest at night. This did not necessarily mean that bedtime was at curfew. In reality, the necessity of completing domestic or work-related chores meant that many continued to work into the night on tasks that would not disturb neighbours (Ekirch, 2005, pp. 157–164). However, as Fitzherbert had noted, there was a cost-benefit calculation to be done when deciding whether or not to continue work after dark. The popular idiom "not worth the candle," based on the French saying "the game's not worth the candle," expressed the idea that the profit from any activity continued into the night must exceed the cost of lighting (Entry "candle," in Ayto, 2009).

Whether or not proverbial wisdom concerning early bedtimes continued to reflect the reality of night-time labour in the early modern era, moralists disapproved strongly of two habits associated with upper-class profligacy: lying in bed during sunlight hours, and night-time sociability. It was this, rather than being awake after dark in itself, that was associated with luxury and excess. As artificial light was expensive and inadequate, rising early to make the best

use of daylight was simply common sense for the vast majority. It was in this context that Benjamin Franklin made his famous reference to the old English proverb. Less well known is a satirical letter he published in a Paris magazine in 1784 entitled "An Economical Project." This mocked the profligacy of the elites of Europe who sought increasingly sophisticated lighting technology for evening entertainments but failed to recognise the value of sunlight. The fictional writer expresses surprise at learning that the sun rises between six and eight in the morning, and that, simply by rising before noon, he could have light for free (Koslofsky, 2002, p. 743). The common-sense husbanding of time was therefore figured starkly in contrast to the prevailing fashions of the *ancien régime*.

This was not dissimilar to sentiments expressed in London publications. The Very Useful Manuals disapproved of any pastime that involved unnecessary expense, and this was expressed in terms of social identity. In *A Present for an Apprentice*, Barnard made a distinction between habits suitable for "a man of business" or "citizen," and those he disdainfully referred to as a "gallant," "courtier," "fortune-hunter" or "fop." Pursuits that were unsuitable for men of business included attending the playhouses, operas or concerts, drinking in taverns, dancing, gambling and masquerades. Nor should he attempt to learn an instrument or associate with professional musicians. The "fop's" love of showy clothes was effeminate and foreign, as well as ruinous: "in a citizen, an affectation of this kind is never to be pardoned." Instead, the tradesman should pursue recreation that involved little or no expense, such as reading, viewing fine landscapes, fresh air and good weather. It is notable that this regime rejected expensive night-time City pleasures in favour of natural pleasures that could be appreciated during daylight. Recreation, economy and sleeping habits were inextricably combined in a way of life strongly defined against the kind of dissipated style of living evoked by Dekker in the previous century (Barnard, 1740, pp. 15, 35–40). Unlike the gull, the tradesman must resist the temptation to gain social credit by aping upper-class habits of dress and socialising, if he is to succeed. Barnard foresaw social ridicule: "Looseness and prodigality will be called living like a Gentleman, and you will be upbraided with meanness, and want of spirit, if you dare to persist in the ways of economy and virtue" (Barnard, 1740, p. 27).

Although the trading personality must separate himself in dress and lifestyle from the gentleman, the aim of success in trade was social advancement. These texts held out the possibility that, by careful economy of time and assets, a person of no fortune could gain the wealth and property that was associated with the landed gentry. The *Compleat Tradesman*, a guide to trading written by a London merchant, told the story of a landed gentleman from Surrey who was forced to rent out his land to a farmer to pay off some debts. Before the lease was finished, the farmer asked the landlord if he would sell him the land outright. Surprised that someone from such a modest background could afford to become a landowner, the gentleman asked the farmer to explain his success. The farmer replied, "You lay in Bed, or took your pleasure, and sent others

about your Business: And I rose betimes and saw my Business done myself." In case it is not obvious, the author expounds the moral of this story: "in all Countries the Sun riseth in the Morning, Occasion then combining her Head, and putting the Lock of successful Opportunity into your hand" (*Compleat tradesman*, 1684, pp. 4–5).

The contradiction in these texts was that they conceived of a social mobility made possible by separating oneself from the society of those of the social station they wished to join. Daniel Defoe suggested that, in reality, many apprentices succumbed to such social pressures and participated in City nightlife:

> We scarce now see a tradesman's apprentice come to his fifth year, but he gets a long wig and a sword, and a set of companions suitable; and his wig and sword being left at proper and convenient places are put on at night after the shop is shut, or when they can make a flip out to go a raking in … from this cause it is principally, that so many apprentices are ruin'd, and run away from their masters before they come out of their times.
>
> (Defoe, 1726, p. 129)

Noxious damps and vapours

Both Locke's treatise on education and the tradesmen's books promised health and happiness at the expense of the immediate pleasure of evening socialising. This was a problem, because business and pleasure were closely related in eighteenth-century London. Nothing demonstrates so clearly the contradictions inherent in Enlightenment society's cultivation of sociability and the pursuit of health and happiness as the life of physician George Cheyne. Born near Aberdeen, Cheyne came to London in the first decade of the eighteenth century. Looking back on his life as a young man, he described how his way of living radically changed upon entering London society:

> I found the *Bottle-Companions*, the *younger Gentry*, and *Free-Livers*, to be the most easy of *Access*, and most quickly susceptible of *Friendship* and *Acquaintance*, nothing being necessary for that Purpose, but to be able to *Eat* lustily, and swallow down much *Liquor*.
>
> (Cheyne, 1734, pp. 325–326)

It was not only the pleasure-seeking lifestyle that made this circle of acquaintance attractive to a man in Cheyne's position. His friends amongst the gentry were not only his companions, but also his clients. His contemporary Bernard Mandeville describes a similar way of building up a professional base in London's social scene:

> if you can Chat, and be a good Companion, you may drink yourself into Practice … [or] you must … keep a set of Coffee-Houses, observe your

> certain Hours, and take care you are often sent for where you are, and ask'd for where you are not.
>
> (cited in Guerrini, 2000, p. 5)

In 1705 Cheyne's health collapsed. With his health and practice in ruins, he retired to the country to reflect upon the state of London society. He spent the rest of his professional career writing against the luxurious lifestyle of the upper classes in a series of highly popular health guides. His autobiography reads like a religious conversion narrative, except that it was for the sake of his health, more than his soul, that he radically changed his living habits. He adopted a diet of milk and vegetables. He was in bed by 10 o'clock every night and rose at six (Cheyne, 1734, pp. 361–362; Handley, 2016, pp. 36–37).

In a chapter on sleep and watching in *An Essay of Health and Long Life*, he reiterated the old argument that it was unnatural to stay awake at night and to sleep during the day, but with more force and at more length than physicians of previous centuries. The night air was full of damp, heavy and harmful vapours, he warned. As digestion was the main activity of the body during sleep, it was nonsensical to go to bed many hours after eating or with a belly full of drink and a heavy supper. Lying "lolling and soaking" in a warm bed was the worst possible thing for the constitution, "it *thickens* the Juices" and "*enervates* the Solids." He praised early rising in Romantic terms. Rise early, he promised, and enjoy:

> The Influence of the fresh, benign, Morning Air, the retreating of all the noxious Damps and Vapours of the Night, together with the Clouds and Heaviness, that are thrown upon the Brain from Sleep; and lastly, that Chearfulness and Alacrity that is felt by the Approach or Presence, of that glorious Luminary the Sun, which adds a new Force to the Heart, and a Spur to the Spirits.
>
> (Cheyne, 1725, pp. 77–88)

At this time of day, the body would have energy, a clear mind, and gentle passions.

The popularity of Cheyne's publications, which went through multiple editions, suggests that many shared his perception that the rhythms of socialising and sleeping in eighteenth-century society had become wildly off-kilter. This is further evidenced by entries in gentlemen's magazines. In 1710, a contributor to the *Tatler* decried the late hours that had become fashionable in London. He recollected approvingly a time when the curfew bell was the signal for putting out the candle and going to bed. The time of rising should be six, he insisted. Research conducted by Sasha Handley also suggests that the new fashion was not always welcomed even by those who practised it. Both men and women expressed in their diaries an inner conflict between the desire and need for sleep, and the requirement to fulfil the obligations of politeness (Handley, 2016, pp. 151–163).

The belief that the new fashion for socialising was unnatural and bad for the health persisted into the second half of the century. In his guide to healthy living, *An Easy Way to Prolong Life* (1780[?]), John Trusler regarded sitting up late and sleeping in as unnatural, and therefore one of the worst things for the constitution. Sunset, the "shutting in of the day," was the time that nature had appointed for all living things to rest. Forcing the animal spirits to continue active at a time of day when they naturally withdrew hastened old age by drying out the body and made the face appear flushed. Sleeping late delayed evacuation of excrement from the body, causing blockages that dulled the brain and the senses. If fatigue made it necessary to sleep a little longer in the morning, this should not be past 9 o'clock (Trusler, [1780?], pp. 9–11).

Enemies of sleep

Not all were convinced by the rhetoric of health manuals and gentlemen's magazines. Rejecting the advice of physicians, proverbial wisdom and the new polite sociability, a portion of London society embraced a hedonistic definition of liberty and asserted the privileges associated with the old order.

The problem with the Lockean universal moral gentleman wasn't simply one of lost pleasure. By adopting rules of temperance, prudence and self-denial that could be shared by tradesmen, one ran the risk of looking like a tradesman. In an unfinished play begun by John Vanbrugh in the 1720s, an aristocratic lady replies to her husband's criticism of her habit of staying out until 3 o'clock in the morning: "your eleven has a dull, drowsy, stupid, good-for-nothing sound with it. It savours much of a mechanic, who must get to bed betimes that he may rise early to open his shop." Her husband cannot object to her late-night socialising, she reasons, because her companions are of the highest social status (cited in Koslofsky, 2011, p. 146). Two conflicting ideas of polite conduct arose: according to the first, laws regarding times of rest and rising should be governed by rules of health, convention and the needs of domestic management; according to the second, the respectability of social activities depended not on the time of day but on the company that was kept.

Class tensions were most pronounced, however, when it came to those who rejected notions of civility altogether and refused to live by any rule. The "rake" was another successor to the Jacobean gull. "Rakes" were upper-class young men and their associates amongst the intelligentsia and artistic circles, who were given to gambling, drunkenness, sexual licence, gratuitous violence and destruction of property. Whereas the gull had been boorish out of foolishness, the rake committed acts of incivility deliberately for the pleasure of shocking society. Much of the rake's escapades took place at night-time in taverns, brothels and alehouses, instigated by notorious libertine clubs, the names of which inspired fear amongst respectable citizens – the Bugles, the Scowrers, the Hectors and the Mohocks, to name but a few. Roger Ekirch in his study of early-modern night-time culture includes an entire chapter on the unruly behaviour of aristocratic youths after dark. Spilling out into the streets, the

lawlessness of rakes resulted in assaults on the watch, on private property and on innocent citizens attempting to reach home at night, or whose homes were broken into (Bryson, 1998, ch. 7; Ekirch, 2005, ch. 8). As John Gay put it in his poetical portrait of London streets by night:

> Now is the time that rakes their revels keep;
> Kindlers of riot, enemies of sleep …
>
> (Gay, 1716, p. 52)

Some very prominent people embraced the libertine lifestyle. Charles James Fox, the leader of the Whig Party in the late eighteenth century and a close friend of Prince George, was known to sit up all night gambling before appearing next morning to speak at the House of Commons (Linanne, 2006, pp. 233–234). The behaviour of rakes at night was a deliberate flouting of the expectations of sleeping patterns established in medicine, law and notions of civility, and an example of a form of social posturing Anna Bryson has termed "anti-civility" (1998, pp. 252–253). At one level, anti-civility was a way of identifying oneself with the highest ranks of society. Whereas those who had made their own fortunes sought to establish themselves as gentlemen through observing the rules of politeness, those who were gentlemen by birth had no need to be careful of their reputations. In fact, acts of incivility or lawlessness could be a way for the landed classes to assert the centuries-old privileges of birth in an urban context where the meaning of "gentleman" was becoming blurred. The most notorious example of this kind of class-conscious anti-civility took place on Bow Street in 1663. Sir Charles Sedley, Lord Buckhurst and Sir Thomas Ogle came out onto a balcony next to the cook's house where they were drinking and, in full view of the watching crowd, pulled down their breeches and defecated in the street. Sedley then stood naked on the balcony preaching blasphemy. These actions have been interpreted by Anna Bryson as gestures of contempt and superiority by these men against their audience of tradesmen (1998, pp. 254–255, 262–263).

Similarly, night-time "frolics" were a way for the upper classes to express disdain for the rules of proper conduct that generally applied to London citizens. Medieval and early modern legislation in some European cities had exempted the nobility from rules around carrying lights, swords and firearms after dark, and a sense of entitlement lingered. In 1641, Lord Fielding was highly offended when his carriage was stopped by the watchmen when travelling through London at 1 o'clock in the morning. The constable in charge was forced to retract, explaining that he did not recognise the nobleman's carriage in the dark (Griffiths, 2008, p. 335; Ekirch, 2005, pp. 66–67). Double standards were sometimes upheld by the courts. A case brought in 1687 in which a watchman was killed by the young sons of noblemen in a drunken clash in the early hours of the morning was found to be an "accident" (Koslofsky, 2011, pp. 149–150).

The aristocracy saw disorder as solely the privilege of their own class. In a late seventeenth-century play called *The Scowrers*, a lower-class imitator "scours" a

tavern full of tradesmen and is reprimanded by the leader of the nobles' gang for attempting to "usurp the sins of gentlemen" (cited in Bryson, 1998, p. 250). Acts of anti-civility led by aristocratic youths were deeply conservative. They asserted an aristocratic form of masculinity, based in codes of honour and displays of violence, as opposed to the new codes of polite masculinity. They laid claim to a right to libertine behaviour that was a privilege only of the landed classes, vying against the new class of prudent, bourgeois gentlemen. Public acts of disorder and incivility at night were also a reaction against eighteenth-century attempts by the authorities to civilise night-time sociability, sometimes resulting in the smashing of street lamps and insults or attacks on watchmen. They fought to defend an older version of noble male dominance of the night against both the feminised, civilised nightlife represented by brightly lit theatre, coffee houses and pleasure gardens, and the wisdom of educational handbooks linking early bed times with health and respectability (Kelly, 2006, pp. 776–782, 792–795; Koslofsky, 2011, pp. 142–149).

At one level this was pure snobbery. A fashionably dissolute lifestyle was a way for those born into wealth to distinguish themselves from the middle classes. However, in the poem "Night, an Epistle to Robert Lloyd" (1761), Charles Churchill offers a more subtle critique of contemporary attitudes. Churchill was a clergyman (before his notoriety forced him to give up the profession) and a member of the scandalous gentleman's club The Franciscan, which engaged in drinking, sexual liaisons and mock religious rites (Sambrook, 2004). In this poem, he pictures himself in the company of his friend and drinking companion Robert Lloyd at a late hour and imagines the disapproval of civil or "prudent" society:

> The wretch bred up in method's drowsy school
> ....
> Turns up his eyes to think that there should be,
> Among God's creatures, two such things as we;
> Then for his nightcap calls, and thanks the powers
> Which kindly gave him grace to keep good hours.
>
> (Churchill, 1933, ll. 19–30)

Churchill's night is the time for true society, when troubles are eased by companionship – the companionship of a "narrow circle of our chosen friends" and the companionship of women, which "makes society complete." Night is a time of mirth, good humour and wine (Churchill, 1933, ll. 289–294). He extols the equity of night-time society, when the dress that distinguished social rank is cloaked in darkness and people are revealed for who they really are. Roger Ekirch has argued that a large part of the appeal of nightlife was that it "revolutionised the social landscape." In brothels and taverns, the highborn mixed with the lowest in society, sometimes in disguise so that their rank could not be recognised. The politeness, deference and reserve that dominated social relations during daylight hours was cast aside, replaced by physical intimacy

and candid conversation (Ekirch, 2005, pp. 210–226). This is Churchill's chosen society, which he compares favourably to the society of daytime, ruled by the demands of commerce, rank and self-interest (Figure 8.2).

The poem is an attack on the coalition of medicine, advice manuals and proverbial wisdom that combined to censure night-time socialising. In Churchill's poem, the whole concept of "good" and "bad" hours are merely a social construct on which nobody can agree on the details, and many pay only lip service. The prudent man who goes to bed at 10 o'clock and the socialite who lives his life "in downright opposition to the sun," both claim for themselves the identity of the respectable man who "keeps good hours" (Churchill, 1933, ll. 31–40). Though quite a long time before the poem was written, we might think of the 1687 trial in which a number of character witnesses testified that the young noblemen who killed the watchman in the early hours of the morning "kept good hours," with apparently no sense of irony (Koslofsky, 2011, pp. 149–150). Churchill also suggests that many were in the practice of meeting prostitutes or engaging in drunken behaviour outside the confines of the City gates, so as to protect their reputations (1933, ll. 320–324). He is irreverent towards the prevailing Hippocratic medicine of the time objecting that one



Figure 8.2 The rake carouses in a tavern full of prostitutes. Engraving by Thomas Bowles, 1735. Courtesy of the Wellcome Collection.

rule concerning sleep could not be applied to people of varying constitutions (Churchill, 1933, ll. 57–84). Such rules also offended against individual liberty because they denied the right of a man to decide for himself how best to use time in light of his own circumstances (Churchill, 1933, ll. 49–56).

Churchill saves his most caustic attacks for traders: "slaves to business, bodies without soul/ Important blanks in Nature's mighty roll" who "solemnize nonsense in the day's broad glare" (1933, ll. 7–9). He is scathing of those who have made their fortune through trade and who live to a rigid schedule. He sees the values of the trading class as undermining true relationships: "upstart knaves grown rich, and fools grown great" who "meanly overlooks a friend distressed" (Churchill, 1933, ll. 88–90). Such people lack individuality and soul, who live their lives "clockwork-like" (Churchill, 1933, l. 25).

Churchill had his own axe to grind and his portrayal of night-time society is romanticised. Night-time gatherings often ended with prostitutes stealing from their clients while they were drunk or asleep. The revelry of gentleman's clubs could erupt into violence against pedestrians, women and watchmen that ended in injury, rape and death (Ekirch, 2005, pp. 222–226). His alternative vision of liberty is unsettling, nevertheless, because it suggest an underlying paradox at the heart of the "early to be, early to rise" motto. Whereas social rules surrounding sleep purported to be civil, they could actually be deeply antisocial when they saw time in purely monetary terms and reduced human relations to a financial transaction.

"Foppish" sleep

The advocates of discipline countered the appeal of urban hedonistic living by linking early rising with robust masculinity and vitality. In both Locke's writing and the trading books, styles of living were linked to particular masculine identities – the "beau" versus the "man of business"; "disorders" and "debauchery" opposed to the man of civilised conversation and disciplined conduct. Two stereotypes of gentlemanly idleness and excess are recurrent in eighteenth-century literature: the "rake," whose behaviour was riotous (as seen in the previous section), and the "fop," who was vain, effeminate and addicted to luxury and comfort. While Locke sought to reform the conduct of the landed classes on the basis of the promise of health, liberty and independence, for an eighteenth-century middling family who relied on the precarious income from trade, the image of the idle gentleman was a spectre that endangered their very existence in polite society (Smail, 2008).

Over the course of the eighteenth century, the concern that dissolute living habits were ruinous to health developed into a concern that they were threatening the very foundation of masculine identity. This anxiety took form in the stereotype of the "fop." Appearing in the last decade of the seventeenth century, the fop was a successor to the Jacobean gull or gallant, sharing his desire to be thought refined in upper-class urban society alongside his inability to please. He was obsessed with appearance, spending large amounts of

money on clothes and much of his time at fashionable resorts. Whereas the gull described in Dekker's guide had only St. Paul's Walk (the central isle of St. Paul's Cathedral) to show off in, by the late seventeenth century, the fop had a greater range of public spaces for polite display. The coffee house, the theatre (where he could appear in a side-box) and the public park had become haunts of the urban socialite. The antisocial nature of the fop's conduct stemmed from his narcissism, which was based in an excessive self-consciousness about the rules of politeness and a trivial approach to civility. Failing to understand that the purpose of civility was to ease social interaction, his showiness betrayed a lack of awareness of the needs of others or of what he owed to wider society (Carter, 1997).

The image of the "fop" caricatured the lifestyle of the idle rich as effeminate as well as irresponsible. "He that sets up for a *Sir Fopling Flutter*, instead of *a compleat tradesman*," wrote Defoe, "is not to be thought capable of relishing this discourse" (1726, p. 142). Concern for appearance, nice manners and a love of conversation were seen to be crossing over from the female to the male realm. As Craig Koslofsky has noted, this excess of politeness could be attributed in part to new forms of night-time sociability, which critics saw as feminising European culture. They compared the active pursuits of the countryside gentleman, such as hunting and horse racing, to the sedentary pursuits of evening leisure in the city. Men sat talking in coffee houses "like women at a Gossiping" (Koslofsky, 2011, pp. 162–163).

This effeminacy was also demonstrated in morning routine. One of the distinguishing features of the fop caricature was his tendency to waste the morning in dressing and looking at himself in the mirror. His effeminate delicacy was seen in his resistance to early rising on account of hypochondriacal fears about his health. Lord Foppington in John Vanbrugh's comedy of manners *The Relapse* (1696) never rose before 10 o'clock because "'tis the worst thing in the World for the Complexion," was never dressed before 1 pm and spent his time at the chocolate house and the theatre instead of attending to business at the House of Lords (Vanbrugh, 1697, Act 2, Sc. 1).

During the second half of the eighteenth century, opposition to excessive luxury in men's lifestyle and dress became increasingly medicalised as fears increased over its enervating and emasculating effects. Medical authorities condemned rouge, powder and constrictive clothing as inhibiting the circulation of the blood and blocking the pores. On the basis of this, Enlightenment thinkers such as Rousseau and Lavater promoted a more "natural" style of dress that enabled an upright, unaffected masculine physiognomy (McNeil, 2007, pp. 396–397). Following Tryon, Locke and Cheyne, lying in a warm bed during the morning hours was also criticised. The Methodist leader John Wesley, who rose at 4 o'clock to attend prayer meetings, emphasised the importance of early rising for physical and emotional, as well as spiritual, health (Handley, 2016, pp. 79–81).

The chivalric ideal of education for boys became popular as a way of countering the debilitating luxury and over-politeness that was believed

to be weakening the population. This was partly inspired by the Scottish Enlightenment. Enquiring into the origins of civilisation, Enlightenment thinkers suggested that the age of chivalry was an important transitional stage from barbarism to a refined society. As Locke had suggested earlier, the new system of education placed an emphasis on teaching young men to endure hardship, in order to secure manliness and independence. Effeminate delicacy and excess were regarded as the enemies of liberty (Cohen, 2005).

Writing in the first half of the nineteenth century, William Cobbett (1763–1835) associated early rising and the rejection of comfort and luxuries with robust masculine health, industry and success. Cobbett rose from relative obscurity as a younger son of a farmer and publican to become a member of parliament. He attributed his success to his habit during his early years in the army of getting up at sunlight during the summer months and at 4 o'clock in winter. In his *Advice to Young Men*, published in 1829, he emphasised the importance of making use of "as much of the day-light and as little of the candle-light as is consistent with the due discharge of your duties." His writing exhibited a similar nostalgia for the rural lifestyle in which sleep followed the rhythms of day and night that can be found in Locke and Cheyne's work. He describes how the military men under his command were able to spend the morning fishing, walking the woods or gathering berries, on account of this habit of rising early. These habits were good for the health and passions of the body (Cobbett, 1829, §38–39).

Cobbett not only stipulated early rising but also described how a young man should behave upon getting out of bed. It was useless to rise early if the morning was wasted in luxurious habits. He should be taught to shave in cold water without a mirror, for "a looking-glass is a piece of furniture a great deal worse than useless." The vanity of staring at one's own reflection could waste up to 50 minutes in the morning and waiting for a servant to light a fire to heat the water would cause further delays in beginning the business of the day. Cobbett disapproved of the use of garments such as morning-gowns, which, he argued, was equivalent to remaining "still in a sort of bedding." "Those who first invented morning-gowns and slippers could have very little else to do," he scoffed, "These things are very suitable to those who have had fortunes gained for them by others" (Cobbett, 1829, §38).

Cobbet's writing shares some of the concerns found in Dekker's satirical "rules for the morning" written two centuries earlier. While the culture and night scape of London had changed radically, conduct writers still looked with disapproval on late rising. By the nineteenth century, health, sleep and productive habits had become intertwined with a rejection of other luxuries such as dress, looking glasses and heated water. For Corbett, those who inherited wealth were encumbered by these luxuries. The man who could endure and make his own fortune was truly liberated. Influenced by ideas such as those of Cobbett, the indolent upper-class gentleman became a stock character in Victorian novels, always compared unfavourably with the more industrious country-folk or the energetic early riser. Mr. Lockwood in Emily Bronte's

Wuthering Heights sleeps until 10 o'clock in the morning (Brontë, 1847, p. 135). The foppish Joseph Sedley sleeps through the sound of the din of the bugles, drums and bagpipes announcing the departure of the army for the battle of Waterloo (Thackeray, 1848, p. 265).

Conclusion

The impact of urban environments has become a matter of particular interest in twenty-first century studies of sleep and health. Has a 24/7 society created a chronically sleep-deprived population? Has the introduction of artificial light disrupted ancient circadian rhythms? (Ekirch, 2015; Williams, 2005, pp. 101–107). We can see the origins of these anxieties about modernisation in Enlightenment ambivalence concerning the impact of urbanisation. On the one hand, artificially lit urban environments were seen as progressive because they provided the space and time necessary for the social commerce on which trade and intellectual enquiry depended. On the other hand, there were fears that urban life was becoming dislocated from the natural rhythms of day and night that continued in the countryside. This was not only a matter of "good" health but also of "masculine" health. Luxurious sleep on feather mattresses that lasted through the morning was believed to soften the body, creating a delicate "feminine" constitution. While some libertines mocked the medical theories that underlay such beliefs, by the nineteenth century the kind of austere regimen recommended by Locke had come to signify robust masculinity and independence.

Note

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9 Wasted days and wasted nights

Sleeping and waking in the long eighteenth century

Roger Schmidt

"Tomorrow is an old deceiver, and his cheat never grows stale."

Samuel Johnson

Since 2007, the makers of the "Fitbit" watch have been promising to improve your life: the "Fitbit" monitors diet, sleep, exercise, stress level, pulse rate, and metabolism; it provides you with a regimen – complete with goals, reminders, and progress charts on your phone – that if followed, promises greater health, happiness, and productivity. The "Fitbit," indeed, is the apotheosis of the philosophy of the non-naturals for maintaining health through regimen that remained popular in the eighteenth century: by following a proper diet, getting exercise, and maintaining healthy sleep, one will prolong life considerably and perhaps avoid doctors altogether. The approach to health focused on the non-naturals beats loudly in the twenty-first century. Our belief in the power of regimen seems boundless. In this chapter, I will discuss sleep regimens in the long eighteenth century.

According to Matthew Walker, Professor of Neuroscience and Psychology at UC Berkeley, and author of *Why We Sleep: Unlocking the Power of Sleep and Dreams*, "Sunlight acts like a manipulating finger and thumb on the side dial of an imprecise wristwatch" (2017, p. 17). This "imprecise wristwatch" within our brain controls our circadian rhythms, and like an antiquated watch, it apparently needs to be reset each morning by the rosy-fingered Dawn: "The light of the sun methodically resets our inaccurate internal timepiece each and every day, 'winding' us back to precisely, not approximately, twenty-four hours." Walker's research represents the latest scientific research on sleep, but his clockwork metaphors are decidedly old – dating back at least to the seventeenth century and used first by Descartes and Hobbes. The metaphors were originally inspired by mechanical clockwork figures such as Vaucanson's famous duck.

While clockwork metaphors inform and structure Walker's discussion at every level, at times one sees their limitations. The scare quotes around "winding" indicate that we are not literally being "rewound" each morning, it is just a manner of speaking. But are we to believe that after three million years of evolution, humans have nothing better than an "inaccurate internal timepiece"

perpetually out of synch with the rising sun? Might there be a better, non-mechanical, metaphor to explain this process? *Precisely* 24 hours is a human construct, of relatively recent origin, inconceivable before the development of mechanical timepieces and so precise that every four years we add a day to our calendars to make up the gap between our abstract construct and the real world. As the historian Lewis Mumford argued in 1934, the rise of mechanical time in the medieval period "disassociated time from human events and helped create the belief in an independent world of mathematically measurable sequences: the special world of science" (1934, p. 15). Walker imposes his "belief" in the independent reality of minutes and seconds – that is to say, mechanical time – upon the sleeping body, thus turning the sleeping body into an "inaccurate" clock. Our bodies are sensitive and infinitely subtle in ways still beyond our knowledge; the clockwork metaphor may be of practical value, but its correspondence to biological processes, such as human sleep, is limited.

I want to examine the shift from organic time to mechanical time and its influence on regimen in the eighteenth century, especially with regard to the non-natural category of "sleeping and waking," one of the six categories of hygiene associated with Galenic medicine. I begin with two watches: the one used by Lemuel Gulliver on his various travels, and the other – a stop watch – used by the physician John Floyer on his rounds of the village of Lichfield. I then move to three different treatises on non-natural regimens by John Trusler, George Cheyne, and John Wesley. Cheyne and Trusler bring a thoroughly mechanistic description of sleeping and waking to the Galenic conception of the four humours. Wesley recapitulates Cheyne, but adds to the discussion the new idea of sleep discipline. From Wesley I move to a satire by Joseph Addison, the famous essayist, who presents the casual life of a London gentleman as recorded in a regimen diary. I conclude with one of the great figures of the eighteenth century, Samuel Johnson, whose belief in regimen, especially with regard to sleeping and waking, was matched only by his utter inability to follow regimen. His manic-depressive temperament would not yield to the idealised healthy life promised to those who got out of bed by 8 a.m. His failure with regimen occasioned considerable guilt.

Though the shift from organic time to machine time may have begun in the medieval period, it dramatically accelerated in the late seventeenth century with advances in clock technology and the development of reasonably affordable pocket watches (Landes, 1983, pp. 1–13, 85–187). This shift in the felt sense of time affected the practice of regimen to varying degrees, especially with regard to sleeping and waking. A watch allowed exact regimens with proscribed times for eating, fasting, and sleeping. Such punctuality reinforced the idea of the body as a machine, an idea originating with the clockwork figures in medieval churches which performed all manner of curious gestures, some more reverential than others. The history of these figures, and the evolution of the idea of the body as machine, has been carefully traced by the historian of science Jessica Riskin in *The Restless Clock* (2016). With regard to medicine, one sees in the eighteenth century the valorisation of control: the more exact one's manner of living, it stands to reason, the healthier the

body. The Lilliputians in *Gulliver's Travels* seem fascinated by how much deference Gulliver, a surgeon who had studied physic exactly "two years and seven months at Leyden," gives to his watch:

> Out of the right Fob hung a great Silver Chain, with a wonderful kind of Engine at the bottom. We directed him to draw out whatever was at the end of that Chain; which appeared to be a Globe, half Silver, and half of some transparent Metal; for, on the transparent side, we saw certain strange Figures circularly drawn, and thought we could touch them, till we found our Fingers stopped by the lucid Substance. He put this Engine into our Ears, which made an incessant noise, like that of a Water-Mill: and we conjecture it is either some unknown Animal, or the God that he worships; but we are more inclined to the latter Opinion, because he assured us (if we understood him right, for he expressed himself very imperfectly) that he seldom did anything without consulting it. He called it his Oracle, and said, it pointed out the Time for every Action of his Life.
>
> (Swift, 1726, p. 18)

By taking the Lilliputian perspective, Swift defamiliarises the pocket watch, giving some indication of how normalised its use had become by 1726. Gulliver's explanation to the Lilliputians seems less than clear, presumably because the idea of mechanical time is utterly foreign and abstract. Indeed, all explanations of time, upon enquiry, turn out to be imperfect. The Lilliputians would touch the numbers, as if tactile knowledge might help them understand, but their fingers are stopped by the strangeness of glass: time is not something that can be touched or felt. It has no reality, yet those "certain strange Figures circularly drawn" on a dial profoundly control our life. By Swift's time the watch had become an "incessant" mechanical god whose preciseness one must accommodate. With the ascendance of mechanical time in the seventeenth century, the felt sense of life changed dramatically and irrevocably. In *The Shallows: What the Internet Is Doing to Our Brains*, Nicholas Carr devotes several pages to Joseph Weizenbaum, the German computer scientist who pioneered the development of AI but then turned apostate. Carr writes that Weizenbaum:

> Argued that the conception of the world that emerged from timekeeping instruments 'was and remains an impoverished version of the older one, for it rests on a rejection of those direct experiences that formed the basis for, and indeed constituted, the old reality.' In deciding when to eat, to work, to sleep, to wake up, we stopped listening to our senses and started obeying the clock. We became a lot more scientific, but we became a bit more mechanical as well.
>
> (Carr, 2011, p. 211)

Helping usher in this new "reality" was John Floyer, a seventeenth-century practitioner of traditional Galenic dietetic medicine who lived and

breathed regimen. He brought to the ancient art of taking the pulse a new instrument of his own design, a chronometer which measured time not just by hours and minutes but even by seconds, and which had a lever for stopping the movement of the seconds hand – the first "stop watch," as it were (see Figure 9.1). Floyer commissioned the distinguished horologist Samuel Watson to build the "pulse-watch" sometime around 1695, and then spent the next decade counting his own pulse and the pulse beats of his patients at Litchfield hospital, meticulously keeping records and assembling tables. He published the results of his study in *The physician's pulse-watch; or, an essay to explain the old art of feeling the pulse and to improve it by the help of a pulse-watch* (1707).

Sleeping and waking pulse rates were correlated with the times of the day, the phases of the moon, the particular season, the barometric pressure, and the outside temperature. Floyer also constructed a table of the ideal pulse for every 5 degrees of latitude from the equator, starting with 120 beats per minute at the equator and ending with 30 beats per minute at the pole: the median heartbeat of 75 (according to his records) corresponded to 45 degrees latitude, the mid-point between the equator and the pole, a theoretical affirmation of

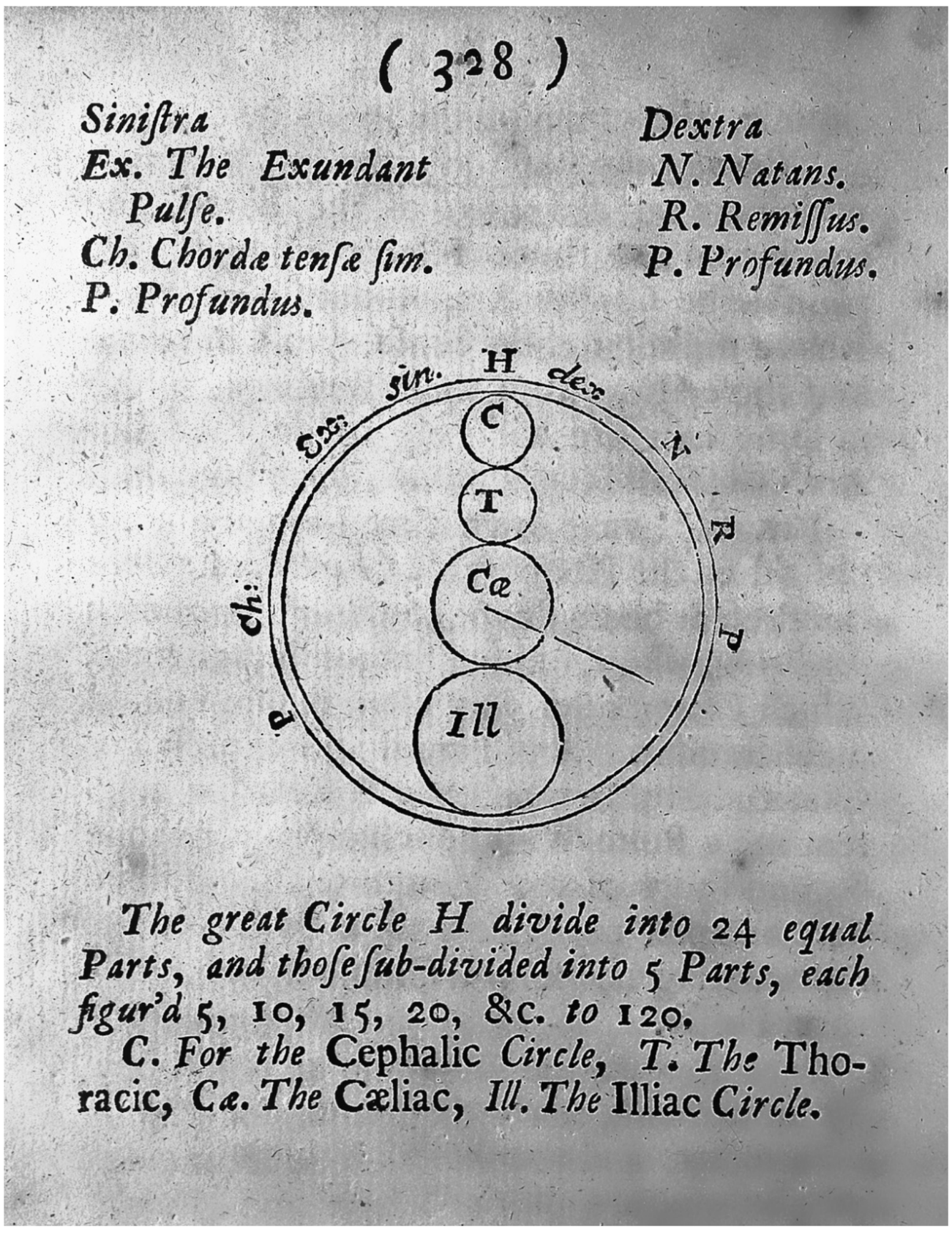


Figure 9.1 Floyer's schematic drawing of his pulse-watch (1710).

the Galenic middle way. Using a watch, Floyer standardised regimen according to collected data. The "old art of *feeling* the pulse" gave way to collecting data about the pulse.

Floyer's basic premise that the body's internal motions can be charted against a clock and compared to a number derived from the mechanical perfection of the Newtonian universe is hardly objective; he made the evidence fit his theory. But such extensive collection of data forms a significant part of the Enlightenment revolution in medicine (Daston and Galinson, 2007, pp. 55–113). Where Galen had had such classifications for the pulse as "leaping like a gazelle" (*pulsus caprizans*) or "crawling like an ant" (*pulsus formicant*), Floyer gave us beats per minute. Emphasis shifted from the qualitative analysis of the pulse, which had engrossed Galen (he wrote eighteen treatises on the pulse), to quantitative data: the heart rate measured against time (Fleming, 1997, p. 20). In creating what could be called the first "fitness watch," Floyer provided a data-driven means for measurement of health, and thus created a more rigorous protocol for determining regimens for sleeping and waking.

Floyer made tangible the Newtonian metaphor of the body as clockwork: as heavenly bodies move with precision, so does a healthy heart. The body becomes a mechanism whose health is measured by the ticking of a mechanical watch. Kepler, extending his study of planetary motion to the motions of the body, had been disappointed to find the average pulse about 70 beats per minute, and not 60, which would have accorded better with the mathematical beauty of the universe as described in his *Harmonices Mundi*. He abandoned his study of the pulse: *le couer a ses raisons que la raison ne connait point*. In 1628, William Harvey, charting the circulatory system, had seemed nonchalant about the actual pulse rate: "In half an hour, the heart makes over a thousand beats; indeed, in some individuals, and on occasion, two, three, or four thousand" (1628, p. 51). Galileo, also interested in the pulse rate, invented a special kind of pendulum: one adjusted the length of the pendulum until it synchronised with one's pulse, thus the measurement was relative to itself, not to the mechanism: whether *allegro moderato* or *largo*, a felt-sense of life always musical (Newton, 2004, p. 1). With Floyer and the "pulse-watch," we have the felt-sense-of-life-mechanical, the body itself as clockwork, a metaphor so irresistible to the scientific mind that it passes as fact: we speak of the body's circadian or internal "clock" with complete confidence, and with little historical awareness of how this metaphor has shaped our understanding of the sleeping body.

About 70 years after Floyer's experiments with the pulse-watch, the Reverend John Trusler published a pamphlet titled *An Easy Way to Prolong Life by a Little Attention to Our Manner of Living* (1775). Trusler claimed the eminent physicians Dr. William Hunter and Dr. George Fordyce as his mentors, and to have an MD from Leiden University. At this time, Trusler's fame, such as it was, rested on his edition of Hogarth's graphic work *Hogarth Moralized* (1768). The consistent moral focus of Hogarth's satire, for Trusler, concerned the excesses – the lack of regimen – among the wealthy. In Plate II

of *Marriage-a-la-mode*, for example, "The Tête à Tête," Trusler notes that the madam has just arisen at noon, after only an hour or two of sleep, "not a little characteristic of the irregularity and disorder that reigns within the house" (1768, p. 60) (see Figure 9.2).

For Trusler, maintaining health is an easy matter, requiring only modest adjustments to "our manner of living," and in this regard his pamphlet anticipates the self-help genre of books promising miraculous transformations in so many easy steps (Trusler has 18 such steps to follow at the end of his pamphlet, compared to Matthew Walker's 12 in *Why We Sleep*). While Trusler does not specify how long one might hope to live, other authors of regimens, such as James Graham, thought 150 years was entirely possible, as did Descartes (Graham, 1783, p. 3; Haycock, 2008, p. 41). Trusler begins *An Easy Way to Prolong Life* by invoking the clockwork metaphor:

> The human body is a piece of mechanism, that requires care and attention. It may be compared to clock-work, which, if not kept free from dust and other extraneous, injurious substances, will presently be out of order.
>
> (Trusler, 1780, p.1)



Figure 9.2 Plate II of *Marriage a la Mode*.

In other words, health is the normal state and disease a result of a neglect of hygiene, and responsibility for health rests on the individual rather than the doctor. He extolls the foundational precept of dietetic medicine: "He that lives by rule and wholesome precepts, is a physician to himself, and needs not the help of others" (Trusler, 1780, p. 23).

This message of self-reliance continues in his discussion of sleep. Trusler advises against sleeping later than nine when the "recruited" spirits are flowing outwards, an action aided by the sun and the returning warmth of day; to sleep longer than nine o'clock perverts the natural course of the spirits and courts disease. The total number of hours of sleep needed each night for optimal health depends on whether or not "concoction" has been completed:

> Heaviness of the head and eyes, or a taste of our last meal, signify that we have not slept a sufficient length of time. In short, six, seven or eight hours is long enough for young persons in health, but such as are sickly and weak require longer rest, nine, ten or eleven hours. Children and old men require more sleep, in general, than young or middle-aged persons; children that their growth may the better be promoted, and old men, because it lessens the dryness of their constitution.
>
> (Trusler, 1780, p. 13)

If "the dryness of their constitution" seems quaintly Galenic, the idea that growing children need more sleep is perfectly sound. Indeed, much of Trusler's regimen accords remarkably well with current trends in sleep advice: one should get about seven hours of sleep a night, or perhaps more if one feels heavy upon awaking; one should not eat a large meal before bedtime; exercise in the morning or afternoon is conducive to restful sleep; one should avoid stimulating the mind before bed; one should sleep in a cool room and keep daytime naps short. Healthy sleep is the key to vitality in mind and body; healthy sleep will prolong your life.

Trusler focuses on the "spirits," which during the day dilate and reside in the extremities, and at night coalesce (in a healthy individual) into the centre of the body where they perform "what is called concoction; that is they return to perform their vital operations, to nourish and refresh the system" (1780, p. 13). We know concoction has been completed by "a sensible lightness of the body, especially the head; the emptiness of the stomach, and a certain desire of evacuation." In addition, Trusler notes that "Sleeping generally on the back is unwholesome, as the humors of the head naturally fall by this means into the hinder part of the brain and may disorder it" (1780, p. 18). Thus, one should sleep on one's side with the head of the bed slightly elevated to facilitate the return of the spirits to the centre. If having recently eaten before retiring, an act to be avoided whenever possible, one should begin sleep on the left side "as the food will in this case better descend to the bottom of the stomach." Furthermore, if one must nap during the day, and thus upset the natural tendency of the spirits to dilate outwards, this nap should be in a sitting position to lessen the effect of vapours

rising upwards from the stomach. Lastly, an overactive mind before retiring will hinder the descent of the spirits and result in unquiet sleep, and is likely to cause dreaming, a sure indication of unsound sleep.

> Sleep is a placid state of body and mind, giving refreshment and ease to both; for as an exertion of the faculties either of mind or body exhausts our powers, rest will restore those powers. The powers of the mind are like a small current, which is sufficient to keep up a continual motion. If we want to give this water greater power, we dam it up, and when the water is run from the dam, if we wish to produce a fresh power, equal to the first, we shut the sluices, and collect the water again: so it is with the mind, in sleep. In perfect sleep, both the body and mind are at rest.
>
> (Trusler, 1780, p. 8)

In other words, sleep functions like a dam; when we fall asleep, somewhere in the brain a sluice gate closes, and behind the gate the vital currents of the mind begins to back up. This is a placid state of perfect rest. After eight hours or so, the reservoir is full, the sluice gates open, and body and mind are suddenly animated. One can imagine a clockwork figure powered thus by water, but when applied to the human brain, it seems simplistic.

Yet, such simple metaphors have enduring appeal. Matthew Walker, in describing the neuroscience of sleep deprivation, compares the rising level of adenosine in the brain to "rising water in a plugged sink when a faucet has been on" (2017, p. 34). When we at last fall asleep, the drain opens. Dean Buonomano, a professor of neurobiology and psychology at UCLA, compares the "circadian clock" that controls our sleep patterns to a water tank on a toilet with a tiny leak: the float slowly descends until it triggers the valve to fill again. "The circadian clock," Buonomano writes, "is, of course, way more complicated than your toilet, but the idea is the same" (2017, p. 46). The same idea, I suppose, if one thinks at a level of generality so high as to be nearly meaningless. Buonomano concludes:

> Like the clockmakers of the eighteenth century who struggled with the effects of temperature on pendulum and mechanical clocks, evolution had to overcome the problem that the speed of biomechanical reactions changes with temperature. We still do not fully understand how ectothermic organisms … maintain a period of approximately 24 hours over daily and seasonal temperature fluctuations. But we know that there are a lot of additional proteins and genes that interact with the basic molecular machinery … and some of these bells and whistles likely contribute to temperature compensation.
>
> (Buonomano, 2017, p. 47)

For Trusler, mechanical explanations of sleep supported the idea of God as a perfect watchmaker; nature can be understood mechanically, and mechanical

explanations allow one to argue backwards to the existence of God, the so-called Argument by Design. Neuroscientists generally reject the Argument by Design, but still retain the mechanical explanations. For Buonomano, "Evolution" is imagined to be a struggling circadian clockmaker trying to overcome an engineering problem, one which – if Walker's "imperfect internal timepieces" give any indication – has yet to be solved. Buonomano's conception of evolution, at least as expressed here, involves both agency and teleology, ideas generally regarded as incompatible with a basic premise of evolution, that it is a random process. Evolution has no problems to solve, it simply is. Buonomano notes that we "still do not fully understand" how the process of sleeping and waking works. If our understanding is to deepen, perhaps the mechanical language, the clanking machinery of the Enlightenment with all its bells and whistles, should be scrapped.

Trusler touched upon the importance of all the non-naturals and their relation to sleep: air, food and drink, exercise, retentions and evacuations, and the passions of the soul, thus his regimen is broadly representative of eighteenth-century practice. On the other hand, George Cheyne, whose *Essay of Long Life and Health* (1724) outlined the most influential regimen of the time, tends to focus on digestion, perhaps not surprising given his own struggles with obesity:

> There is nothing more certain, than that (abstracting from *acute* cases) our Sleep is sound, sweet and refreshing, according as the alimentary Organs, are easy, quiet and clean. If any one not suffering under any disease, is disturbed in his Sleep, 'tis certain his Stomach is filled with Food, or Crudities; or his Guts filled with Wind, Choler, or Superfluous Chyle: And those restless Nights, and the difficulty of going to Sleep, which are generally ascribed to Vapors, are entirely owning to these Causes; … And upon complaints of such restless Nights, I never once failed, upon enquiry of finding the true Cause in the Diet, of the preceding Day, or of some few Days before; and constantly have discovered that some error in Eating or Drinking, either in Quantity or Quality has produced them.
>
> (Cheyne, 1724, pp. 79–80)

Cheyne exaggerates in ascribing all sleep problems "to error in Eating and Drinking," but not as much as one might think. His concern with the gut seems remarkably prescient, given recent research into the importance of the microbiome and its influence on all aspects of our health (Mayer, 2016, pp. 3–103). Though the underlying theory is entirely mechanical, his practical advice – based on empirical evidence as witnessed in the description above – is uncannily current. Cheyne advocates taking little or no supper, and if one must eat, "it ought to be vegetable food" taken several hours before going to sleep, thus allowing time for the vacation of the alimentary passages. Such "vacation," current research seems to indicate, promotes a healthy gut, as it allows the esophagus, stomach, and small intestine to convulse and clean the alimentary passageways, thus allowing healthy bacteria to thrive. Cheyne advises going to

bed between 8 o'clock and 10 o'clock in the evening, sleeping eight hours, and then taking "a light *vegetable* Breakfast" around 11 o'clock in the morning, resulting in a fast of 15–17 hours. Again, recent research suggests that such "intermittent fasting" may have numerous health benefits, including a healthy microbiome (Mayer, 2016, pp. 283–4). Given that many of the things that keep a person awake at night – heartburn, bloating, anxiety, and depression – have been linked to an unhealthy gut, Cheyne's regimen for sleep is remarkably sound. His advocacy of a vegetarian, or near vegetarian diet, as a means to healthy digestion, is also prescient. As Cheyne realised over 200 years ago, and as we are coming to realise now, health (and achieving a good night's sleep) is all about the gut.

Significantly, neither Cheyne nor Trusler make mention of a "first sleep" or a "second sleep," an indication, perhaps, that this pattern of sleep had disappeared. The so-called "segmented sleep," an older, pre-industrial sleep pattern, consisted of a first sleep of about four hours followed by an hour or so of wakefulness, and then a second sleep, or "morning sleep," of about three or four hours (Ekirch, 2006, pp. 300–32). In its place, we find the single block of sleep of about seven or eight hours advocated by Cheyne and Trusler, and widely taken to be the norm today. This change in sleep patterns, I would argue, begins around 1660 when tea and coffee take London by storm, and along with mechanical clocks and a proliferation of reading material, create something like the modern consciousness (Schmidt, 2003, pp.129–49). At the very least, daytime drowsiness and caffeine addiction become normalised in urban areas, inspiring satires as well as sermons on the sin of sloth.

For a seeming enactment of this shift on an individual basis, one can look at the sleeping life of John Wesley, founder of Methodism and author of the tract *Primitive Physic* (1747), an influential dietetic pamphlet based on Cheyne's *An Essay of Health and Long Life*. Wesley viewed regimen as the key to health and spiritual wholeness, the "method" at the heart of Methodism, and in 1775, in his sermon "On Redeeming the Time," gives a detailed description of his own sleep regimen. The sermon takes as its text *Ephesians* 5:16: "See that ye walk circumspectly, not as fools, but as wise men, redeeming the time" (Wesley, 1798, p. 1). Wesley notes that he is the first writer ever to understand this verse in the context of sleep, an indication of a shift in attitudes towards sleep and its relation to time. Sleep, an activity regarded by Trusler and Cheyne as necessary for maintaining and restoring health, is now viewed as a potentially dangerous waste of time. Asking his parishioners "what harm is there … in lying in from ten till six or seven in summer, and till eight or nine in winter?" Wesley goes on to tell them:

> what I am about to say will probably be quite new; different from anything you ever heard in your life; different from the judgment, at least from the example, of your parents and your nearest relations; nay, and perhaps of the most religious persons you ever were acquainted with. Namely, that the traditional sleep of our ancestors, of eight hours or

> more, *wastes* valuable time: Do you really desire to know what harm there is in not redeeming all the time you can from sleep? Suppose in spending therein an hour a day more than nature requires? Why, First, *it hurts your substance*; it is throwing away six hours a week which might turn to some temporal account. … If you are of no trade, still you may so employ the time that it will bring money, or money's worth, to yourself, or others.
>
> (Wesley, 1798, p. 4)

The shift from organic to mechanical time transformed time into a commodity, a *thing* that could be saved or wasted. Writing in 1673, Bishop Baxter, in *The Christian Directory*, makes this transformation clear:

> Keep up a high esteem of time and be every day more careful that you lose none of your time, than you are that you lose none of your gold and silver. And if vain recreation, dressings, feastings, idle talk, unprofitable company, or sleep be any of them temptations to rob you of any of your time, accordingly heighten your watchfulness.
>
> (Baxter, 1673, p. 59)

Baxter's comments come 70 years before the clearest expression of the commodification of time, Benjamin Franklin's "Remember, young man, time is money."

In *The Protestant Work Ethic and the Spirit of Capitalism*, Weber singles out Baxter for bringing to prominence the sin of wasting time in the late seventeenth century: "Waste of time is thus [for Baxter] the first and in principle the deadliest of sins" (Weber, 1905, p. 157). As innocent as it may seem, sleeping longer than necessary is morally reprehensible. And with a watch, there is no human activity – even sleep – that cannot be measured and quantified, and valued or devalued accordingly. The most striking indicator of the world we have lost is not that time can now be wasted, but that it *will be wasted* unless we take active measures to prevent it. Let no hour be unemployed.

Sleeping overlong concerned Cheyne and Trusler because it injured one's physical health; for Wesley, it undermines spiritual health. Wesley acknowledges that too much sleep damages the nervous fibres, but a more serious concern is the sinful waste of time. Wesley rejects Bishop Baxter's estimate of four hours sleep a night as too extreme (as well as Bishop Taylor's estimate of three hours). He himself sleeps only six hours a night, a figure arrived at by empirical experiment, one he invites any doubting listeners to try:

> If anyone desires to know exactly what quantity of sleep his own constitution requires, he may very easily make the experiment which I made about sixty years ago: I then waked every night about twelve or one, and lay awake for some time. I readily concluded that this arose from my lying

longer in bed than nature required. To be satisfied, I procured an alarum, which waked me the next morning at seven; (near an hour earlier than I rose the day before) yet I lay awake again at night. The second morning I rose at six; but, notwithstanding this, I lay awake the second night. The third morning I rose at five; but, nevertheless, I lay awake the third night. The fourth morning I rose at four; (as, by the grace of God, I have done ever since) and I lay awake no more. And I do not now lie awake (taking the year round) a quarter of an hour together in a month. By the same experiment, rising earlier and earlier every morning, may anyone find how much sleep he really wants.

(Wesley, 1798, p. 3)

We see enacted here the consolidation of sleep into a single block of time. Sometime around 1722, waking in the middle of the night around 1 or 2 o'clock in the morning, that is, after his "first sleep," Wesley finds his wakefulness problematical in a way earlier generations had not: did he listen to the ticking of his watch? He procures an "alarum," presumably mechanical, to wake him at 7 o'clock, then 6, then 5, and then 4 o'clock – that is, until he reaches a state of sleep deprivation that consolidates his sleep. He notes with satisfaction that he now lies awake fewer than 15 minutes in any given month. Such a sleep pattern indicates chronic sleep loss, given that one measure of sleep deprivation is how quickly you fall asleep when lying down. Wesley falls asleep almost immediately, never lying on his pillow fretting over wasted time. Wesley found that point where sleep debt ensures a rapid onset of sleep, but is not entirely debilitating. Whatever evolutionary needs the body had for two periods of night-time sleep have been overridden by the body's need to reclaim any lost sleep it can.

Wesley does not mention his addiction to tea, which he "largely and frequently drank," beginning around 1720 and, but with one exception, lasted his entire long life. He describes his early symptoms in *A Letter to a Friend Concerning Tea* (1749):

> being otherwise in Health, I was a little surprised at some Symptoms of a Paralytick Disorder. I could not imagine what should occasion the shaking of my Hand; till I observed it was always after Breakfast, and that if I intermitted drinking Tea for two or three Days, it did not shake at all.
>
> (Wesley, 1749, p. 4)

He cuts back on tea consumption, though the tremor does not abate, and his tea drinking continues until August 1746, a date which coincides with his reading of Cheyne's *An Essay of Health and Long Life*. Cheyne advised against black tea as it weakened the nerves, advice repeated in Wesley's *Primitive Physic*, which comes out in 1747. In his *Letter to a Friend*, Wesley describes quitting tea in terms congruent with caffeine withdrawal: "When I first left off Tea, I was half asleep all Day long: my Head ached from Morning to Night: I could

not remember a Question asked, even till I could return an Answer" (1749, p. 8). Wesley describes tea as "a slow poison," a "deadly poison" – it unstrings the nerves, especially those of weak constitutions. Despite his extreme sleepiness upon quitting tea, Wesley makes no connection between tea and his sleep regimen of six hours a night. In 1758, under advice of Dr John Fothergill, the wealthy London Quaker and physician, Wesley reversed his position on tea and resumed the habit. To accommodate his thirst for tea, in 1761 he commissioned his friend, Josiah Wedgwood, to make a gallon-sized teapot. Tea thus becomes the official drink for Methodists.

In *Spectator*, No. 317, 4 March 1712, Joseph Addison satirically presents the regimen of a pre-Wesleyan man not fully committed to redeeming the time. Addison presents six days of a wasted life, notably leaving out Sunday, the one day doing nothing is culturally sanctioned. The sense of waste comes not from what this man does or does not do, but from placing his life in the context of clock time: each entry begins by noting the hour, implying that "One a Clock in the Afternoon" can be significant only in terms of what you have accomplished that day. This focus on quantification mocks the ordinariness of human life:

> MONDAY, *Eight a Clock*. I put on my Cloaths and walked into the Parlour.
> *Nine a Clock, ditto*. Tied my Knee-strings, and washed my hands.
> *Hours Ten, Eleven and Twelve*. Smoaked three Pipes of *Virginia*. Read the *Supplement* and *Daily Courant*. Things go ill in the North. Mr. *Nisby's* Opinion thereupon.
> *One a Clock in the Afternoon*. Chid *Ralph* for mislaying my Tobacco-Box.
> *Two a Clock*. Sat down to Dinner. *Mem*. Too many Plumbs, and no Sewet.
> *From Three to Four*. Took my Afternoon's Nap.
> *From Four to Six*. Walked into the Fields. Wind, S.S.E.
> *From Six to Ten*. At the Club. Mr. *Nisby's* Opinion about the Peace.
> *Ten a Clock*. Went to Bed. Slept sound.
>
> (Bond, 1965, vol. ii, p. 154)

Without sneering, Addison teaches us to sneer (in Pope's memorable phrase) at someone whose sleep is long and sound, with an additional sneer for that 3 o'clock nap. The afternoon walk in the fields – the exercise segment of the non-natural regimen – is here an utter vacuity; and noting wind direction, of interest to someone concerned about the quality of London air, becomes farcical. The memorandum on the food served at dinner, a tip worthy of Cheyne, becomes the fussiness of someone whose life is empty. As the week progresses, the diarist's sleep schedule slowly breaks down, and he notes his recurring dreams about a Grand Vizier: nothing more trivial, Addison implies, than taking note of one's dreams. Forget Shakespeare's the balm of hurt minds and Bottom's transformative dream – the activity of sleep loses all qualitative value.

Rather, we should see sleep as an untapped source of minutes for us to redeem. In conclusion, Addison recommends to his readers,

> the keeping a Journal of their Lives for one Week, and setting down punctually their whole Series of Employments during that Space of Time. This kind of Self-Examination would give them a true State of themselves, and incline them to consider what they are about. One Day would rectify the Omissions of another, and make a Man weigh all those indifferent Actions, which though they are easily forgotten, must certainly be accounted for.
>
> (Bond, 1965, vol. ii, p. 156)

"Punctually" is the key word. If we record our life against the numbers on a clock, we see that the "indifferent Actions" that make up the bulk of our time, activities that might be called "living," will now be filed away, permanently it appears, under *wasted time*. With a watch, "moderation in all things" has become "monitoring in all things." This is the liability of proscribed regimens: they bring out obsessive tendencies. Health advice is healthy only if not too closely monitored.

Wesley ends "Redeeming the Time" by quoting William Law, whose *Serious Call to a Devout and Holy Life* (1728) profoundly shaped eighteenth-century religious culture. Law amplifies the concerns of Baxter over wasting time in sleep. His strident voice runs wildly counter to the moderate non-natural regimens:

> Sleep is such a dull, stupid state of existence, that even amongst mere animals, we despise them most which are most drowsy. He, therefore, that chooses to enlarge the slothful indulgence of sleep, rather than be early at his devotions to God, chooses the dullest refreshment of the body, before the highest, noblest employment of the soul; he chooses that state which is a reproach to mere animals, rather than that exercise which is the glory of Angels.
>
> (Law, 1729, p. 229)

Inspired by Law, Baxter, and others, the English clergy in the eighteenth century mounted a united front against sleep, "the dullest refreshment," and sought to turn eight hours of sleep into a source of guilt. "Sleep discipline" becomes possible through the heavy use of tea and coffee, and is aided by the rise of mechanical time that is independent, if not divorced, from the natural cycles of light and dark – to a machine, all hours are the same.

Law's *Serious Call* had a profound effect on the young Samuel Johnson:

> When at Oxford, I took up Law's 'Serious Call to a Holy Life,' expecting to find it a dull book (as such books generally are), and perhaps to laugh at it. But I found Law quite an overmatch for me; and this was the first

> occasion of my thinking in earnest of religion, after I became capable of rational enquiry.
>
> (Boswell, 1791, p. 1.19)

Law's influence on Johnson is evident in Johnson's conflicted attitude towards sleep. Johnson's sleep was notoriously irregular, and try as he might, he never could rise before 8 o'clock, "eight being the latest hour to which bed-time can be properly extended." He might have had better luck rising had he gone to bed before 4 o'clock, something that rarely happened, given his endless cups of tea (as many as 24 cups in one sitting); his inability to lay aside whatever book he happened to be reading; and the mix of nocturnal anxieties about death that disturbed his mind, not least being his acute sense of wasted time, for which he believed he would be called to answer, no matter that by any rational standard his was an enormously productive life. Life measured against a clock – as Addison would have us all do – can seem frighteningly empty.

On the eve of Easter Sunday 1772, alone and late at night, Johnson opens his diary to write down his resolutions for the coming year. One imagines him contemplating the gaps in his diary and trying to recall what has passed:

> April 18, 1772
>
> When I review the last year, I am able to recollect so little done, that shame and sorrow, though perhaps too weakly, come upon me; … my sleep has generally been unquiet, and I have not been able to rise early. My mind is unsettled and my memory confused. … By sleepless or unquiet nights, and short days, made short by late rising, the time passes away uncounted and unheeded. Life so spent is useless.
>
> I hope to cast my time into some stated method.
> To let no hour pass unemployed.
> To rise by degrees more early in the morning.
> To keep a journal.
>
> (Johnson, 1785, p. 111)

The blank pages in his journal stand as confirmation of a wasted life, of a year where hours and minutes passed "uncounted and unheeded." Unable to recall what he did, the past year feels like an abhorrent vacuity: life so spent is useless. He resolves to regiment his life, to keep a journal, and to rise more early in the morning – religious resolutions cast in the form of time management, and thus resolutions devoid of any religious feelings save dread and hopelessness.

In 1768, Johnson had commissioned a watchmaker to inscribe upon the dial of his pocket watch, in Greek, "the Night Cometh," an exhortation to get more work done. He soon had the inscription taken off, claiming it was pretentious.

Sitting down at midnight and reviewing the previous year, Johnson felt a dreadful emptiness. Yet when we review the same year in Boswell's massive *Life*, there are 34 quarto pages detailing a life rich in intimacy, from 30 March

1771 to 18 April 1772, a life full and varied with "all those indifferent Actions" which Baxter condemned as time wasters, Addison disparaged as trivial, and Boswell chronicles with the skill of a Dutch realist. And what did Johnson do, on 19 March, Easter Sunday, after he finally rose from bed? There was much idle talk. Boswell and General Paoli paid him a visit before dinner and the conversation ranged from, among other things, whether or not blind people could discern colour by touch, to the techniques of jugglers and fraudulent gamesters, to Swift's prose style, to whether, if a toad could utter sounds as beautiful as a female singer's voice, we still think the toad ugly? "JOHNSON: 'No, Sir, it would be admired. We have seen fine fiddlers whom we liked as little as toads,' (laughing)" (Boswell, 1791, p. 1.379). Life so spent is rich, satisfying – but with "the time cometh" inscribed on your watch, apt to seem useless.

One of Boswell's innovations as a biographer included running a marginal head on each page of the *Life* that kept track of Johnson's age (*Aetat. 63*) and the year (*1772*), a running chronometer, as it were. Sometimes a day runs on for several pages, sometimes an entire year passes in a paragraph, or is missing altogether, but always with each page turned the sound of a life hastening towards its sombre end. The marginal calendar imposes an after-the-fact regimen on what was an unregimentable life:

> Every thing about his character and manners was forcible and violent; there never was any moderation; many a day did he fast, many a year did he refrain from wine; but when he did eat, it was voraciously; when he did drink wine, it was copiously. He could practice abstinence, but not temperance.
>
> (Boswell, 1791, p. 2.371)

And when he stayed up late – and he stayed up late *every* night – it was until 3 a.m. or 4 a.m. "Only a scoundrel," Johnson says in a mood of bravado, "goes to bed before twelve o'clock." But the mood is very different when he stares at his diary with remorse and anxiety and resolves, once again, to rise at 8 a.m. The annual reckoning as each year quietly comes and goes expresses a new sense of life structured by mechanical time from which there is no refuge. *The Life of Johnson* is an enormous accomplishment, and presents a record of "all those indifferent actions" that would shame us were we to look at our watch – the conversations in taverns, the secret collecting of orange peels, the irrational laughter into the night sky, the walks, the 24 cups of tea at one sitting, the bow-wow manner, *etcetera ad infinitum*. "Dictionary Johnson," who might as aptly been called "Insomnia Johnson," the most monumental figure in eighteenth-century London, could not sleep at night, tormented by a sense of life wasted for which he would be held to account by God.

As *Ephesians* 5:16 took on new meaning for Wesley in the light of mechanical time, so too does *John* 9:4 for Johnson: "I must work the works of him that sent me, while it is day: the night cometh, when no man can work." One

can never work enough. And God now wears a watch. Thus today's enormous desire for fitness watches that track your every motion and beat of heart and record it for all eternity – you can review the past year and there will be no blank pages. We can take that afternoon walk into the fields, and it will be preserved for us to ponder: number of steps taken, calories burned, time elapsed down to the hundredth of a second. Deeply consoling. We are alive. Unless there is a technology failure, and then that day, that walk, that workout, *never happened*, a feeling many have apparently experienced. The fitness watch is the ultimate Addisonian journal, keeping us on regimen, reminding us to go to bed, to get up, a journal that replaces qualitative experiences with quantitative data, a life reduced to numbers whose purpose is to impress others and ourselves. Let no hour be unemployed, no activity unmonitored. The Fitbit thrives in a culture deeply and existentially afraid of wasted time. "The hours of folly are measured by the clock," William Blake wrote in 1790, "but of wisdom, no clock can measure." Regimens are two-edged swords: when followed with moderation, they keep us healthy. When they become an end in themselves, excessive monitoring destroys the health they were designed to maintain.

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Part 5

Excretion and retention



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10 Keeping the body open

Impurity, excretions and healthy living in the early modern period

Michael Stolberg

> On the second of July, at 10 o'clock, I had some meat broth made; until 1 o'clock I went to the toilet another 2 or 3 times. Then I ate some broth with roasted soft bread and ragout with little pieces of chicken meat … , without drinking anything. At 4 o'clock, the belly was moving and I went to the toilet a good number of times. I continued going, close to 15 times, counting from 7 o'clock in the morning. I had a consommé for dinner after 9 o'clock, went to bed at 11 o'clock and got up at 12 o'clock to go to the toilet 4 or 5 times until 9 o'clock on Wednesday morning. … I had a large stool and another two but very small ones around 6 or 7. After 7, I took milk broth with sugar and no eggs and went another 2 or 3 times to the toilet. I had two well-cooked eggs with some salt for supper. I slept and got up 4 or 5 times during the night and had two large stools.

This is only a brief but typical excerpt from a journal with altogether about 70 densely written pages, in which the French writer François-Nicolas Baudot, sieur Dubuisson-Aubenay recorded the state of his health and his personal regimen, day by day, from January 1651 until September 1652. The manuscript, which also contains dozens of recipes and prescriptions and other medical notes, has come down to us as part of the rich collection of Dubuisson-Aubenay's manuscripts in the *Bibliothèque Mazarine* in Paris. A former diplomat and historian, Dubuisson-Aubenay is fairly well known among French historians for his journal of the French civil war and for his accounts of his various travels, including a very lively description of a voyage to Brittany (Dubuisson-Aubenay, 1883–1885, 1886, 1898–1900). In this private journal, which so far seems to have been ignored by historians, he turned his attention with similar attention for detail to his own body. His account goes on like this, page after page, with extensive records on the food he ate, the medicines he took and, above all, their effect on his excretions.

To modern readers Dubuisson-Aubenay's "obsession" with his bowel movements must seem striking if not outright odd. From a contemporary perspective, his close and incessant attention to his excretions made perfect sense, however. Together with air, exercise and rest, waking and sleeping, drinking and eating and the passions, *excretio* and *retentio* – or *inanitio* and *repletio*, as

they were sometimes called – held a prominent place among the so-called six non-naturals and were considered crucial for maintaining and restoring health (Niebyl, 1971).

Dubuisson-Aubenay had no medical training but like many educated people of his time, who read about medicine and discussed health matters with their physicians, he clearly was familiar with these ideas. He often also recorded the time when he went to sleep and he sometimes also mentioned physical exercise, the weather – especially the effects of storms on his health caught his attention – and emotions or passions. Excretion and retention, however, together with the foods and drinks that affected them, took up the bulk of Dubuisson-Aubenay's journal.

He was far from alone in this respect. The detail and consistency with which he recorded his food intake and his excretions over months and months were unusual. As we will see, it reflected not only his gift for careful observation and his habit of recording what he saw and experienced but also his age and his deteriorating state of health. The basic idea, however, that regular and sufficiently copious excretions were crucial for health and a long life was common knowledge at the time and shaped the health behaviour of people from all walks of society. Medical practitioners and patients alike frequently attributed diseases to insufficient excretions, usually caused by an "obstruction" of the excretory pathways or of organs or vessels inside the body.

Keeping the body "open," as it was commonly termed, i.e. assuring regular bowel movements, was therefore an essential element of healthy living. Many people routinely took laxatives or "purgatives," as they were also commonly called, i.e. literally "cleansing" medicines – when they were in good health and even more so when they felt that their health was faltering. In her letters to her friend François-Antoine Devaux, the French writer Madame de Graffigny, for example, frequently mentions the "purgative powders," which she sometimes took for several days in a row. She might even start a letter with words like "Good day, my friend. Yesterday, I have taken my powder again; it has purged me more than on Monday but without harm or pain" (2007, 30 April 1751). When Devaux worried that she might be exaggerating, she defended her trust in her powders, "a remedy, which, by purging me, far from weakening me, strengthens me." She knew a number of people, she claimed, who also took that remedy and enjoyed an enviable state of health (Graffigny, 2007, 5 May 1751). Drinking certain mineral or bitter waters could serve the same purpose: "I have taking a charming [charmante] medicine today," she wrote in 1753, "not knowing how to purge myself because it is still too cold for taking my powders." She resorted to drinking water from Sedlitz instead – and was content: "They have purged me very well, without doing any harm, no pain, no fatigue, no nerve, no vapours, that is charming. I will take more tomorrow" (Graffigny, 2010, 28 January 1753).

As Madame de Graffigny's letters indicate the practice of taking purgatives was in fact so common, among the French upper classes at least, that taking a "médecine" even became to some degree synonymous with taking a purgative.

"Yesterday I took medicine ["medecine"] again," she wrote in 1749, for example. "It cleaned me out a lot; but it is always the same: hardly any bile and lots of thick matter" (Graffigny, 2006, 19 August 1749).

The place of excretion and retention in early modern pathology

The prominent place of the excretions in pre-modern learned medicine and medical lay culture reflected the prevailing pathological theories of the day. This calls for some explanation. For a long time and even in recent publications, historians have claimed that early modern physicians attributed most diseases to an imbalance of the four natural humours in the body (black and yellow bile, blood and phlegm) with their associated primary qualities (cold, warm, dry and moist). However, when we look at how physicians explained individual cases in the thousands of case histories and epistolary consultations that have survived from the sixteenth century onwards, it quickly becomes clear that the explanation of diseases as the result of a humoral imbalance in the body had become virtually irrelevant by the sixteenth century.

In everyday medical practice, the guiding paradigm was, for much of the early modern period, not imbalance but impurity. Most cases of illness were ascribed to more or less specific impure, crude, sharp, corrupted, putrid or otherwise preternatural humours. These morbid humours could spread throughout the body, as in fevers, or they could settle in certain organs or parts of the body, causing local symptoms such as swelling and pain and sometimes setting off harmful fumes or vapours that ascended to the chest and the head.

The most important source of such "peccant" humours was food and drink. By their very nature, they were foreign to the body. Once ingested, they were therefore "matter out of place," to use Mary Douglas' famous definition of dirt or impurity (1970). The useful parts had to be quite literally assimilated, i.e. made similar to the specific substance of the body and its various parts (e.g. Aurelius, 1606). The rest had to be eliminated. The word "digestion" is derived from the Latin "digero," in fact, which quite means "to separate," "to drive apart." According to the Galenic tradition, as summarised by Avicenna in his influential *Canon medicinae*, the assimilation of the useful parts was achieved, in several steps, by heating food and drink inside the body, cooking them, as it were, like food on a kitchen stove, with the innate heat supplying the fire (Avicenna, 1636, pp. 75–84). The first concoction took place in the stomach, from where the useless, harmful residues were excreted with the stools. The useful, "cooked" parts moved as chyle to the liver, where they underwent the second step of concoction which transformed them into blood, with bile as a (useful) excrement flowing off into the intestines and serous fluid that left the body via the kidneys. The third concoction took place in the various parts of the body. They each assimilated those parts of the blood that suited them and left the serous remainders to be excreted through the pores of the skin or to return towards the kidneys and the bladder.

The first concoction was particularly important. Raw, cold, slimy matter inevitably accumulated in the stomach when the food was insufficiently cooked, giving rise to a vicious circle. By its very nature, this matter counteracted the innate heat in the stomach and made the concoction of new incoming food even more difficult. Moreover, the chyle that moved from the stomach to the liver to undergo the second concoction was of inferior quality, as a result, and so was the blood that the liver concocted from it. This was a major reason why countless works on dietetics recommended moderation in eating and drinking and why the choice of suitable food that could be easily concocted and assimilated was of paramount importance (Bergdolt, 1999; Cavallo and Storey, 2014; Gentilcore, 2016). They must not burden the stomach and the body, in general, with more food than they could cope with, health advice books routinely warned their readers. Otherwise, impure, harmful, peccant matter would inevitably accumulate in their bodies. Alvise Cornaro's *Della vita sobria* (1591) with its promise that a long life could be achieved simply by eating less – essentially by always remaining a little hungry – was one of the most successful health advice books of all times.

Within such an explanatory framework, excretions, by necessity, played an outstanding role. With their help, the body constantly freed itself from the preternatural humours that resulted from the concoction of food and drink and, with time, risked undergoing further corruption or even putrefaction (Ranchin, 1627, p. 481). One could eat the best, purest food, André du Laurens explained to his readers, but there would always be parts that could not be assimilated and had to be excreted (1627, p. 2). Otherwise, when they were retained in the body, they caused countless kinds of diseases. Not even kings, Andreas Rüdiger underlined, along similar lines, could avoid the dangers that arose from a corruption of the humours (1728, no page numbering). Health had to be maintained by constantly acting against the bad humours ("humores pravos"), which inevitably corrupted the viscera and destroyed life when they were not excreted in time.

There were quite a number of pathways that Nature used for this purpose. Given their rather unappetizing, stinking nature, the importance of stools and urine for "cleansing" the body of the excremental matter that originated from the first step of concoction, in the stomach and the intestines, was obvious. When the bowels were not emptied once a day (in those who ate immoderately twice), Johan van Beverwijck warned, bad vapours would rise towards the stomach and the adjacent parts and harm them, as well as weaken the head, burden the remaining body and cause flatulence and colicky pain in the intestines themselves (1674, p. 172). Even diarrhoea, Beverwijck claimed, was frequently healthy rather than harmful. It served as a means to eliminate putrid humours from the body right away, which could otherwise cause all kinds of diseases.

In addition, physicians and patients knew a whole range of other excretory pathways and paid great attention to them (Pansa, 1615, f. 132v–133r; Ranchin, 1627; Bacquere, 1673, p. 224). There were many more, in fact, than

we moderns might be inclined to think of at first glance. Half a dozen pathways could be found in the head alone – and they were important. After all, the head was not only exposed to excremental matter that originated in the brain and elsewhere in the head itself. Also morbid vapours that arose from the lower regions of the body ascended to head, where they accumulated under the skull bone and, under the influence of the cool brain, condensed into fluid (Du Chesne, 1606, p. 165). The eyes could serve to get rid of (usually) more watery excretions (Aurelius, 1606, p. 162), as could the mouth by means of spit. The nose could discharge considerable amounts of watery or mucous matter, while more solid matter exited from the ear tubes as earwax (Du Chesne, 1606, p. 165; Horst, 1648, p. 128). Excremental matter frequently was also seen to settle on the tongue or on the teeth; for this reason, it was commonly recommended that one frequently scrape one's tongue and clean one's teeth (Zerbi, 1489, ch. 41; Niger, 1581, no page numbering). The mouth was also the ultimate exit for morbid matter that came from below. Vomiting liberated the stomach of impure matter. Expectoration served to free the airways.

In the rest of the body, the genitals in men (and according to the Galenic tradition those of women as well) freed the body of accumulating seminal matter which might otherwise corrupt. In women, moreover, menstruation was widely described in cathartic terms as a periodic cleansing of the body through the uterus as the *sentina* or *cloaca* of the female body. This periodic cleansing was declared essential for their health, and numerous diseases were attributed to a diminution or total "suppression" of the periods (Du Chesne, 1606, p. 165; see Stolberg, 2000). Frequently, all kinds of often nasty looking and smelling morbid matter could be observed leaving the body via the genitals as well, as in the case of the widespread female whites. Drawing on Galen's work, even milk was sometimes described as an excrement, although a good, useful one (Beyer, 1586).

The excrements from the third concoction emerged as visible – and sometimes rather smelly – sweat. The hair, on the head, on the body and in the face was widely thought to result from the coarse matter that was evacuated through the skin. It risked blocking the pores and, according to some authors, could sometimes even breed lice and other little animals (Niger, 1581, no page numbering; Aurelius, 1606, p. 162; see Stolberg, 2012).

Together with the lungs, the numerous pores of the skin also served as the major pathway for the constant elimination of finer invisible, vaporous excretions by way of insensible transpiration. With his famous weighing chair, Santorio Santorio had shown the large quantities of matter that left the body this way (Santorio, 1720).

In addition, Nature could open vicarious excretory pathways when the natural ones were blocked or proved insufficient. Haemorrhoidal veins could bulge and rupture, giving off dark, morbid matter (Du Chesne, 1606, p. 165). Young people, in particular, often bled from their noses. In women – but sometimes also in men – frequent or indeed periodic bleeding from other body sites could cleanse the body (Hedluff, 1745). In many diseases, ulcers

formed and pustules ruptured, liberating the body of rather unhealthy looking matter.

In spite of the many pathways that Nature had at her disposition, her efforts to get rid of the harmful excremental matter frequently proved insufficient. In this case, the natural excretions had to be actively promoted, or artificial pathways had to be opened. In this respect, retention and excretion held a special place among the six non-naturals. There were considerable differences in terms of social class, but most people had at least some control over what they ate and drank, how much exercise they got and how much they slept and they could at least seek to avoid places and rooms with bad, foul-smelling air and situations that were likely to lead to unhealthy passions. Excretion and retention by contrast were largely beyond the will power and control of the individual. They could be influenced only indirectly by the choice of food and drink and by physical exercise that led to sweating.

Otherwise, one had to resort to active intervention, to artificial means. Dealing with retention and excretion meant moving in the borderland between dietetics and therapeutics, in fact, and frequently in the field of the latter. As we have seen, laxatives played a particularly prominent role in this respect. It was evident to the eyes and to the nose that they freed the body of all kinds of nasty, impure matter. If other natural excretions seemed to be wanting, they also could be increased. Insufficient urinary flow rarely was the problem – except in the case of stones, in which diuretics were of little help or indeed dangerous. By contrast, many people felt that their sweating or transpiration was reduced or indeed "suppressed" due to cold wind or water, for example, which had made their pores contract. In this case, sudorifics could bring relief. Thus, in 1548, when his customary "beneficial sweats" ceased and his gout got worse, Peter Vincentz took a sweat-promoting herbal decoction without even asking a physician (Vincentz, 1918, p. 465). To the same effect, that is to widen the pores and to produce sweating, rubbing the skin with cloth or warm baths could be used (Bright, 1582?, p. 88; Horst, 1648, p. 128). When Joachim Brandis' right calf turned black in 1608, his physicians proclaimed that he had "bad blood" and not only recommended purgatives and sudorifics but also hot footbaths, to promote sweating on his affected leg. He was to carefully wipe off the sweat, presumably in order to prevent the impure, morbid matter from sticking to the skin (Brandis, 1902, pp. 536–538).

In women, menstruation was a matter of major concern. When women felt that their monthlies were not as regular and copious as they used to be, especially with advancing age, they resorted to emenagogues, i.e. medicines that were said to promote the menses. If such attempts failed, other natural excretions had to substitute for the loss. "An opinion generally prevails among the sex," John Fothergill maintained in his work on the female "cessation of the menses" – that "purgatives are particularly necessary at this juncture" (1774, 160).

Last but not least, impure, potentially harmful matter could also be evacuated via pathways that were deliberately created for this purpose. Prophylactic

bloodletting and cupping, to rid the body of such matter, was quite common in the early modern period. It was practiced in particular before and after the winter months when the body was taken to be especially prone to accumulating impure superfluities. Some people also lived for many months with fontanelles. They had a surgeon create an oozing skin ulcer, usually on an arm or on a leg, with a hot iron or caustic ointments and kept it open in order to ensure a constant efflux of unsavoury and often smelly matter, which, as long as it lasted, was the proof, in turn, that the body needed this vicarious pathway.

Iatrochemical notions, which enjoyed a certain popularity in the seventeenth and eighteenth centuries, do not seem to have wrought major changes in the professional and lay understanding of the role and importance of excretions. Like the various steps of concoction in the Galenic framework, chemical processes such as fermentation were taken to separate the "faex," the useless or indeed harmful matter in food, chyle or blood, from those parts that could be assimilated. Impurities, the accumulation of morbid, harmful matter, remained the major issue and an obstruction of major natural pathways of excretion, such as menstruation, continued to attract maximum attention (Musitano, 1709, pp. 45–47).

The rise of mechanist and hydraulic theories in the seventeenth and eighteenth centuries, by contrast, did bring some major changes. Attention shifted from the humours and vapours to the solids and fibres as the primary site of physiological function and pathological disorder. This inevitably also had an impact on the way in which excretions were perceived and explained. The idea of impurity remained alive but maintaining and monitoring the excretions now was deemed important, above all, due to their effects on the circulation of blood and, more generally, of the humours in the limited vascular space inside the body. Insufficient excretions would result in "plethora," i.e. in the accumulation of excessive fluid in the body. Plethora burdened the body and made the life-maintaining circulatory movement of the blood and fluids in the vessels slow down or indeed come to a halt. Within this new framework, regular and sufficiently copious menstruation, for example, continued to be seen as indispensable. But, as many learned physicians now came to see it, menstruation served less as a monthly cleansing of the female body from impure matter. It was, above all, a means to counteract the accumulation of the healthy blood, which women produced every month. It served to nourish the foetus in times of pregnancy but burdened the vessels when the woman did not conceive (Freind, 1729). Menstruation as such, the regular excretion of blood, could now be attributed to the pressure of the accumulating blood in the uterus that finally made the uterine vessels burst. During the days that preceded their period, many women, medical writers claimed, could literally feel, as pain or heat, how the superfluous blood assembled in the vessels in and around the uterus. Other premenstrual complaints could likewise be attributed to the excessive amount of blood in the female body, a sensation of pressure in the head or in the breasts, for example, a feeling of heaviness in the legs, palpitations, or general fatigue (König, 1709, p. 9; Bertrand, 1711; Freind, 1729; Cour, 1733, p. 16). The new ideas gained

considerable traction among the (more educated) lay public. Patients and relatives who asked for epistolary advice now quite commonly began to demand medicines that would permit the blood to circulate more freely (e.g. Barbancon, 1729).

The shift from humoral notions of impurity and putrefaction to mechanistic and hydraulic notions of plethora also changed the perception of the relative importance of the different excretory pathways. Excretions that visibly eliminated blood from the body came to be seen of special value. Haemorrhoidal bleeding, in particular, acquired a more prominent place as a pathway for the elimination of superfluous and vitiated blood alike (Santorini, 1719, pp. 150–188). The shift also implied greater awareness of the dangers of excessive excretions. In the traditional humoral framework, the elimination of impurities and corrupted humours was always welcome, and usually the more, the better. The excessive loss of blood and other natural vital substances tended to be seen as just as harmful as their undue accumulation inside the body.

There were some major changes then in the course of the early modern period. Yet, ultimately, freeing the body of superfluous and potentially harmful matter continued to be seen as fundamental to health. "Health can only be maintained in its perfect state," the *Encyclopédie méthodique* could still proclaim at the turn of the nineteenth century, "when the excretions are performed well" (Vicq-d'Azyr and Moreau, 1787–1830, p. VI.153).

Healthy aging: excretion and retention in the elderly

At the time when Dubuisson-Aubenay wrote his journal, he was in his early 60s. According to contemporary standards, he had thus entered full-blown old age. Old age was commonly taken to begin at the age of 50 and to turn from "green" old age to full-blown old age at 60 or 62, when the often-fatal 63rd year, the *annus climactericus maximus*, approached. Dubuisson-Aubenay felt that his health was deteriorating. His foot hurt him and was a little stiff and, above all, he was plagued by frequent coughing, a well-known sign of possible consumption.

As we have seen, keeping the body "open," i.e. assuring the unimpeded expulsion of excremental matter, was thought to contribute crucially to maintaining (or recovering) health in all ages. For the health of aging people and for achieving a long life, the excretions were believed to be of utmost importance, however. According to ideas that were widely shared in the early modern period, old people were particularly prone to accumulate harmful, impure superfluities in their bodies. Tellingly, a part of Dubuisson-Aubenay's journal already referred in its title to the "impurity" of his blood: "Observations pour la fluxion et mal de poitrine, du pié, et des mains. Et contre l'impurité du sang". The accumulation of impure, putrid matter inside the body was taken to characterise the typical physical constitution of the aging body to the point of affecting even the senses of those around them. According to Ranchin, their breath or more generally their bodily

effluvia – Ranchin used the term "halitus" – were "unpleasant, acid and stinking" because of the "crudities, which abound inside, because of the impurity of their vital parts and because of the bad disposition of their body" (1627, p. 480).

The reasons why old people were particularly prone to accumulate crude, impure matter, were widely discussed in *gerocomiae* and similar early modern works on the health of the aging (Schäfer, 2001). There was some debate on the details but sixteenth- and seventeenth-century authors largely agreed that the crucial cause of aging – and of the numerous complaints and health risks that came with it – was a weakening of the vital, innate heat and of the vital faculties. This was due, in turn, to the fact that the vital spirits evaporated and disappeared (Du Chesne, 1606, p. 169), and to the consumption and insufficient regeneration of the radical moisture, which nourished the innate heat like the oil of an oil lamp (Fumarelli, 1557, pp. 1–89; Du Laurens, 1627; Vereycken, 1738, p. 18; see Schäfer, 2004, 2012). As we have seen, the innate heat was essential, in particular, for the concoction of food. Its weakening inevitably led to an increased production and accumulation of crude, impure and harmful fluid matter in the body.

This also helped explain a seeming contradiction. The aging body was widely believed to become not only colder but also dryer. Wrinkles on the skin were the clearest outward manifestation of this process and the same drying up of bodily matter was assumed to take place inside the body. Yet, old people were known to be particularly prone to suffer from catarrh, nasal discharge and expectoration, which suggested a surplus of moisture rather than dryness. As medical writers explained, however, drawing on Galen, these fluid excretions originated from excremental matter that accumulated between the solids of old people while the solids themselves did, in fact, become dryer and harder (Fumarelli, 1557, p. 1).

Old people were not only thought to be particularly prone to accumulate crude impure, harmful "excremental" matter inside their bodies. The accumulation of such preternatural matter was, in turn, a major reason for aging, as such. The crude, raw matter that resulted from imperfect concoction cooled the natural temperament in the aging body and, in particular, that of the stomach. As a result, the innate heat was weakened and found it more difficult to transform food into useful, perfectly concocted matter. A vicious circle emerges here: the weakening of the innate heat led to an accumulation of crude, excremental matter in the body, which in turn further weakened the innate heat, promoted the accumulation of more excremental matter in the stomach and in the body in general and accelerated death. What is more, the innate heat not only lost its force and its ability to cope with foreign matter. Like the flame of an oil lamp went out when water was poured over it, the "flame of life" could also be suffocated and extinguished prematurely by the excremental humours in the aging body.

In the light of these time-honoured ideas, it is clear that the health of aging and old people depended to a large degree on their ability to get rid of impure, excremental matter: "The consideration of excretion and repletion is of the

greatest importance for keeping the old alive," Ranchin wrote, for example (1627, p. 481). But the problem was that the aging and old bodies not only produced more raw, excremental matter than those of younger people. They also found it more difficult to get rid of the accumulating impure superfluities. For, according to the Galenic tradition, the vital forces, in general, and the *facultas expultrix*, the expelling faculty, with them got weaker with age (Ranchin, 1627, p. 481). Thus, according to Santorio Santorio, it was "because of the decay of their excretory organs" that old people failed "of reaching to a long decrepit old age" (1720, p. 85).

From the seventeenth century, Harvey's discovery of the blood circulation and the rise of iatrophysical concepts inaugurated a shift in interpretation from vital heat and immaterial faculties to mechanistic explanations. The medical literature now came to attribute the changes in the aging body to the solids and more specifically to an increasing rigidity of the fibres (Rüdiger, 1728, p. 455). The fibres in the aging body hardened, Friedrich Hoffmann, one of the leading proponents of the new mechanist theories, wrote, for example, as the "experimentum domesticum" with the meat of older animals showed, which was harder and took longer to cook (1708, p. 15). Ultimately, writers reached largely the same conclusions; however, the bodies of old people found it particularly hard to get rid of excremental matter. In old people, John Quincy, for example, wrote in his commentary on Santorio Santorio's *Aphorisms*, the solids lost their "springs" and their "force of contraction" (Santorio, 1720, pp. 94–99). The parts that were at greater distance from the heart and brain decayed first,

> because those two principal instruments of motion themselves grow too weak and languid to propel the proper fluids into them, and invigorate them in order to the performance [sic] of their respective functions, and therefore the proper discharges by them are hindred [sic], before the stomach loses its powers of digestion.

The successful expulsion of harmful matter that caused, for example, scurvy, venereal disease or cachexia, Hoffmann added, required fibres that were compact and yet sufficiently flexible to permit the necessary expulsive movement, not hardened ones, that is, as those of old people (1708, p. 15).

There were also other more specific reasons for the reduced ability to evacuate impure, peccant matter in the aged. Their skin was harder and of an earthen thickness, as some authors described it (e.g. Ranchin, 1627, p. 480), making it more difficult to evacuate excremental matter with sweat and insensible perspiration. Moreover, as Hippocrates had already observed, the stools of old people were usually dryer. As a result, old people were prone to suffer from constipation. The lungs became weaker with age, Martin Lister added, and were no longer as effective in achieving insensible transpiration, of which, in his opinion, about one-fifth was performed by the lungs in healthy adults rather than just one-tenth, as Santorio had claimed (1703, p. 44). Aging women, in addition to all that, had to cope with the end of the periodic evacuation

of their monthlies. Experience taught that the consequences were frequently fatal (Stolberg, 1999). Their health faltered and many fell victim to cancer of the uterus (where the impure, putrid matter continued to accumulate) and the breast (which stood in a particularly close relation to the uterus).

To some degree, Nature could compensate for these changes. The elderly prolonged their lives, Santorio Santorio claimed, by frequent expectoration, "for if what they spit was retain'd, it being incapable of digestion, would hinder perspiration, from whence would ensue suffocation and death" (1720, p. 94). In elderly men and postmenopausal women, haemorrhoidal bleeding might sometimes also offer a welcome relief (Ranchin, 1627, p. 481). More often than in the young, Nature in the aging body demanded active human intervention or indeed medical support, however. The choice of suitable food and drink, in quality and quantity, could already make a big difference by reducing the amount of crude, impure matter that the body had to deal with in the first place, and thanks to the "medicinal" qualities that many foodstuffs possessed in a wider sense. Sometimes just eating some prunes, figs or raisins might suffice to produce the desired copious stools. Yet, frequently laxatives were needed that were more powerful. As Galen had already underlined in the fifth book of his "De sanitate tuenda," old people needed almost constantly medicines that loosened their stools and promoted the excretion of urine.

Early modern physicians shared this belief – and so did their patients. The whole range of measures that could be used to support the natural excretions or to establish vicarious pathways was perceived as the major means to help people reach a high age. As the physicians reported, old people expected to be given laxatives and made ample use of them. Many of them were outright happy, Ranchin claimed, when purgatives procured copious stools (1627, p. 531). *Errhinia* and *apophlegmatica* could be given to promote nasal discharge and the excretion of saliva, respectively (Pansa, 1615, f. 134r). To increase the excretion of the superfluities from the third concoction, rubbing ("frictions") and warm baths were routinely recommended for the elderly (Zerbi, 1489, ch. 40; Niger, 1581, no page numbering; Pansa, 1615, f. 133v). For those with a good constitution, occasional and moderate bloodletting, in smaller quantities, also was deemed beneficial even at the age of 70 (Ranchin, 1627, p. 534; Zerbi, 1489, ch. 40). Cupping was a good, somewhat milder alternative, especially in the area of the shoulders, where it promoted the evacuation of the peccant matter that frequently flowed down from the brain to the lungs (Ranchin, 1627, p. 534). Leeches were likewise recommended (Pansa, 1615, f. 133v). In fact, when morbid matter or more specifically serous and burnt blood settled in or near the skin, they were the quickest and most convenient means of evacuation (Ranchin, 1627, p. 534). Even artificial ulcers or fontanelles produced by caustic substances or cauterisation with a hot iron could be indicated. If necessary, these fontanelles might have to be kept open for months and years to allow for a constant and ongoing evacuation of excremental matter (Ranchin, 1627, p. 535).

Striking a balance

As we have seen, the excretions – and their active promotion – were seen as indispensable for health and a long life throughout the early modern period and were of paramount importance for the health of the aged. They also carried considerable risks, however. In certain situations, an excessive excretion of superfluities could be harmful or indeed deadly and, at times, the deliberate suppression of natural evacuations was called for (Planer and Rücker, 1583, no. 7, no page numbering; Bacquere, 1673, p. 230).

The basic rule was that one had to strike the right balance. Moderation was the key. Drastic purgatives could weaken the body, depriving it of precious matter, of innate heat and vital powers, and thus ultimately increase rather than prevent the accumulation of excremental matter in the body (Zerbi, 1489, ch. 40; Ranchin, 1627, p. 530). Persistent loose stools could cause dropsy, atrophy, hepatic fluxes and similar deadly diseases, Gregor Horst warned his readers (1648, p. 130). Even Dubuisson-Aubenay, as much as he worried about assuring sufficiently copious stools, noted in a list of "errors" he had committed that he should not have taken strong purgatives at a certain point, because they had weakened him and made him sick. Moreover, some physicians observed that an excessively generous evacuation could aggravate constipation afterwards, especially in the aging. Accordingly, the authors of the *gerocomiae* advised caution in this respect. With old people, one could let three days without stools pass before giving a purgative at all, some of them argued. Also, the old should preferably be given mild purgatives such as cassia or terebinth and not too generous doses either, or clysters could be applied as a similarly mild alternative (Du Laurens, 1627, p. 12; Bacquere, 1673, p. 227).

Similar warnings pertained to bloodletting, which was, next to purgatives, the major means by which physicians sought to support Nature in her efforts to eliminate excremental matter. Especially in the aging body, the physician had to be very careful. After all, blood was the treasure of life, as sixteenth- and early seventeenth-century authors like François Ranchin underlined, and its excretion could be extremely harmful (Ranchin, 1627, p. 533; see Zerbi, 1489, ch. 49). In many ways, the risks of excessive blood loss came to be perceived even more sharply rather than less so with the shift from the humoral notions of impurity and cleansing to the hydraulic and mechanistic model that stressed the importance of blood circulation. While too much blood would slow down the circulation and lead to stagnation, a certain amount of blood was necessary to maintain circulation, and the lack of a sufficient amount of blood that filled the vessel, acute or chronic, was dangerous or indeed fatal.

Moreover, striking the right balance was very important in the case of a rather special type of excrement that was also commonly discussed in the context of *repletio* and *excretio*: semen. As Avicenna (1636, p. 55) had explained in his influential *Canon medicinae*, semen was a residue from the concoction of food – or blood – in the body. Although a very useful one, it was, in

this sense, an excrement (Pictorius, 1549, p. 76; Ranchin, 1627, p. 481). In younger men and women – the Galenic tradition attributed seminal emissions also to women – an excessive accumulation of semen in the body was widely believed to carry considerable risks in the sixteenth and seventeenth centuries. Its timely excretion in sexual intercourse was important for health, and even the legitimacy of masturbation for ailing clerics was discussed in this context. In women, putrefied semen, due to the vapours that arose from it, was widely considered a major cause of the "suffocation of the mother," a quite commonly diagnosed disease that befell virgins and young widows, in particular (Rüdiger, 1728, p. 502). Apart from such favourable effects on the body, the excretion of semen, Georg Pictorius underlined, also was good for the soul. It took away melancholy and acted against anger and fury (1549, p. 78).

Excessive excretion of semen, however, could be fatal. In its pure, uncorrupted state, semen, according to the tradition, was a very precious substance. It stemmed from the best substance in the whole body and was charged with spirits and vital heat. When the principal members were deprived of the nourishment from this "good superfluity," aging and death were accelerated (Pictorius, 1549, p. 76). Even among adults, sexual activity had to be moderate, medical writers warned. Losing too much semen caused memory loss, trembling, bad breath, diseases of the kidney and bladder and toothache, Juan Valverde explained, and some start spitting blood (1552, pp. 77–80). Experience showed that the excretion of a tiny amount of semen in sexual intercourse weakened the body considerably for some time. Timothy Bright suggested, as a rule of thumb, that one limit oneself to once a week or less of sexual intercourse (1582?, p. 88). Otherwise, even adults in their best years risked serious or indeed fatal effects.

Loss of semen held even greater dangers for the aging, especially once "true old age" set in. "Nothing has greater power to weaken the bodies of the aged," Irenaeus Vehr declared (1683, p. 37). Only those elderly men who had a healthy constitution, who were not very advanced in age yet and who were accustomed to it could safely continue to have sex – in due measure (Ranchin, 1627, p. 481). The argument was based on the importance of the precious seminal matter at an age when the innate heat was weakened and the solids with their radical moisture were drying up. The medical condemnation of sex in old age was also interwoven with moral judgements, however, and it was gendered. According to Ranchin, nothing was more "turpis" and "abominabilis," i.e. dishonourable and damnable, than a lusty old man (1627, p. 483). While aging men risked their lives, aging women's health, by contrast, profited from sex. The precious vital substance that men lost in the act was their gain. Elderly women who had sex with young men, Ranchin explained, could almost be "vivified anew," thanks to the infusion of seminal, spirituous matter. The men paid the price. They risked accelerating old age if they did not avoid old women's kisses and embraces (Ranchin, 1627, p. 481).

From the late seventeenth century onwards, concerns also grew about the effects on the young. Medical warnings of the fatal effects of excessive semen

loss gained great momentum (Stolberg, 2003). In the wake of highly successful publications like the anonymous "Onania, or the heinous sin of self-pollution" (1716) and "L'onanisme" by Samuel August Tissot (1760) and their various editions and translations, fear of semen loss became a major cultural force among the more educated classes. Their readers learnt of gruesome stories of (mostly) men who, in the end, literally dissolved into their own excrements or were shaken by epileptic fits as a result of their "vice." The victims might have practiced the "vice" in their youth only but its effects on the body would last. In theory, excessive intercourse could have the same disastrous consequences. Masturbation was proclaimed as much more dangerous, however, because its frequency was not limited by the need of finding a willing partner.

Conclusion

Personal notes like those of Dubuisson-Aubenay and private correspondence like that of Madame de Graffigny just like early modern medical case histories, epistolary *consilia*, physicians' notebooks and practice journals and similar sources that reflect ordinary health practices leave no doubt: assuring regular and sufficiently copious excretions and avoiding the retention of harmful, excremental matter in the body held a very prominent place in pre-modern ideas about healthy living. It shaped people's health behaviour and frequently had a considerable impact even on the very way they lived.

Traces of the pervasive early modern fears of corruption and putrefaction inside the body and of the corresponding belief in the crucial role played by the excretions can still be found in modern medical lay culture. Many people continue to associate menstruation and sweat baths, in particular, with some sense of "cleansing" the body. Mineral waters are marketed for their diuretic effects. Among lay persons, the conviction is also still quite widespread that, in general terms, foodstuffs should be easily "digestible" or according to a still fairly common German term "bekömmlich." Presumably, these expressions also reflect the physical unease that some people experience when they eat, for example, very fat food. There can be little doubt, however, that they ultimately derive from the humoral notion that healthy food has to be easily "digestible," in the sense described above, i.e. making it easy for the stomach and the innate heat to concoct the useful parts and to separate the harmful ones.

In most respects, we find drastic differences, however, when we compare early modern attitudes and practices with those today. In fact, I would argue, the changing interpretation and, above all, the drastically reduced importance of the excretions for health and a healthy living represent one of the most profound and pervasive changes in Western somatic culture over the last centuries. Assuring and maintaining the natural excretions plays only a marginal role in medical lay culture today and attention focuses, in this respect, almost entirely on assuring regular bowel movements, not because of the dangers of retaining impure matter inside the body but because of the unpleasant physical sensations caused by constipation. Sufficient urinary flow usually becomes an issue only when pathological processes such as bladder stones or a tumour

threaten to obstruct it. All the other excretions to which early modern people and physicians paid great attention, such as sweating, insensible transpiration, nasal discharge, earwax or body hair, have faded into the background. They are no longer valued as a means to free the body of unhealthy, potentially harmful matter. Today they are almost exclusively the shameful and disgusting expression of our animalistic nature, which we should be careful not to expose to the eyes and noses of others, by using deodorants, toothbrushes, qtips and the like, and by shaving body hair even in areas where it used to be seen as a powerful erotic stimulus.

The common denominator, when we compare pre-modern notions and practices revolving around excretion and retention with ideas of a healthy living today would thus seem to be a more fundamental one. It is the profound belief that it is in the hands of the individual to achieve health and a long life by following the rules of healthy living and by supporting the body's own forces with medicines if necessary. Dubuisson-Aubenay's journal is an impressive historical document of this belief. Not only did he meticulously record his bowel movements and whatever he found noteworthy regarding the six non-naturals. He was also prepared to pay a high price for his health. His fight against his bad state of health and, above all, his incessant efforts to avoid the production and accumulation of impure matter in the body and to promote the excretions severely affected the quality of his life. His diet was more than Spartan and he had to pay countless visits to the restroom, day and night, sacrificing his sleep.

Sadly, Dubuisson-Aubenay's journal also documents what most people who hope to achieve a long and healthy life through healthy food and behaviour inevitably experience, at some point. It only happened particularly fast in his case. His efforts were ultimately in vain. Neither his careful regimen nor the various medicines and the medical advice of Pierre Bourdelot and other physicians proved successful. His health deteriorated, and in the end his journal documented not the desired return to perfect health but the fatal outcome. A couple of days before he died, he made a last entry in a disproportionately large and virtually illegible hand. The following entry is still in the first person but written in a different hand, presumably on his request: he had received his last rights. He passed away two days later, on 1 October 1652, about 18 months after the onset of his symptoms.

In retrospect, Dubuisson-Aubenay's incessant efforts to expel the impurities from his body may well even have inadvertently contributed to his growing weakness and accelerated his death rather than helping him achieve the long life that countless health advice books promised to their readers. Yet, given his chronic, presumably consumptive condition, it seems unlikely that he would have lived on for years, and his belief that it was in his power to influence or indeed stop the progress of his disease by following the rules of healthy living undoubtedly was an important source of hope and emotional support – as it is for many people today. It gave him agency, a sense of control over his aging and ailing body rather than leaving him condemned to be the powerless onlooker of his declining health and approaching death.

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11 Increasing and reducing

Breast milk flows and female health

Ruben E. Verwaal

Introduction

In 1760, the Hollandsche Maatschappij der Wetenschappen (Holland Society of Sciences) in the city of Haarlem launched an essay competition on the best method for increasing and reducing the flow of mother's milk:

> On the genesis or making of milk during pregnancy or in first-birth women: how to increase and decrease it, and to make it completely dry up or disappear; what seizures does the milk cause most, and what is the way to prevent or cure them?
>
> (de Bruijn, 1977, pp. 35–36)[1]

The topic had not been chosen by chance, for much more was at stake than scientific curiosity. At the time, many young mothers experienced complications when breastfeeding. Women from all strata of society and across Europe struggled with a shortage of breast milk, thought to be caused by malnutrition, disease, mental imbalance or a combination of these. When Maria Jacoba Meinertzhagen (1712–1787) became the mother of Anna Catharina (1736–1783), she could not breastfeed and instead hired a wet nurse (Scheffer, 1884, p. 3).[2] Effective therapies were in high demand, for serious lactation disorders were not uncommon. Surgeon and obstetrician Jacobus de Puyt Jr. (1740–1812), who practised medicine in the city of Middelburg and was an active contributor to the journals of Dutch scientific societies in Amsterdam and Vlissingen, supervised the pregnancy of a Mrs. Pagter, who was expecting triplets. After the delivery she appeared to be fine for a few days, but she was soon badly affected by a milk disorder, which eventually caused her death (de Puyt, 1777).

The concept of the non-naturals in general, and the non-natural of retention and excretion in particular, has received some scholarly attention in recent years (Rather, 1968; Niebyl, 1971; Cavallo and Storey, 2013; Knoeff, 2017). But while these studies have given an overview of all six non-naturals or all morbid excretions of faeces, urine and vomit, they necessarily tend to neglect the numerous ways in which a single fluid like mother's milk can be

secreted and retained. This chapter seeks to address this imbalance by focusing on one particular bodily fluid whose flows were of significant concern among women, parents and physicians alike. In the early modern period, breastfeeding was a popular topic of discussion, both in personal letters and scholarly treatises. Women wrote to each other about their experiences and issues with lactation, while physicians sought ways to treat mothers suffering from milk fever.

The practice of breastfeeding has also received ample scholarly attention. Marylynn Salmon has demonstrated how fertility and breastfeeding were an important physical expression of motherhood in the early modern period, having a significant impact on their social status (1994). George Sussman and Valerie Fildes have shown how numerous women in early modern times adopted the assistance of wet nurses and the hand feeding of porridges, paps and extracts of meat (Sussman, 1982; Fildes, 1986, 1988; Kloek, van Oostveen and Teeuwen, 1991). After all, feeding could be easily handed over to wet nurses, for whom it was a source of income. This also liberated wealthy women from breastfeeding, who were then able to fulfil other duties. Margaret Carlyle has recently shown how a mechanical instrument like the breast pump was a means to support the eighteenth-century campaign in favour of maternal breastfeeding and "natural" motherhood (2017). But up until now, historians have discussed breastfeeding in conjunction with infant feeding and infant health, focusing less on lacteal disorders and the health of mothers.

This chapter contributes to current historiography by looking at lactation and female health. It considers those mothers who, like Maria Meinertzhagen and Mrs. Pagter, struggled with lacteal disorders and sought therapies that were devised to remedy a shortfall or surplus of breast milk. Medical books, lectures and essay submissions to the Holland Society of Sciences reveal that while physicians and women might disagree on the kinds of therapies best used to treat mothers with lactation disorders, they unanimously agreed on the principle of balance between the retention and excretion of milk (Verwaal, 2017b). Furthermore, as the ancient concept of the six non-naturals remained important far into the eighteenth century, the physiology and pathology of mother's milk was increasingly understood in terms of chemistry.

Lacteal excretion and retention

Early modern women experienced various kinds of lactation and breast disorders. Based on letters and case histories, we know that young mothers struggled with the practice of breastfeeding, either because they did not produce enough milk or because their nipples hurt. But besides the issue of feeding, women's own health was at stake: they either produced too much milk and did not retain sufficient nutriments for themselves or they retained too much, causing breast swellings or so-called "milk fever". This section shows that

throughout the period, women and male physicians alike continued to consider a mother's health in terms of the equilibrium between the retention and excretion of breast milk. Far into the eighteenth century, the ancient concept of balance thus continued to determine people's perceptions of healthy lactation.

The early modern period saw a widespread practice of wet nurses and hand feeding of other paps and porridges. Yet in the course of the eighteenth century, physicians came to consider maternal breastfeeding as the best form of healthy lactation. The educational work of Johan Hendrik Swildens (1745–1809) is a perfect expression of this attitude. Known for his political pamphlets and pedagogical works, Swildens authored *Vaderlandsch A-B boek voor de Nederlandsche jeugd* ("National A-B Book for Dutch Youth") to present young people with an alphabet of virtuous topics (1781).[3] The letter "M" stood for "mother", and the accompanying engraving depicted her performing her "maternal duty": breastfeeding (see Figure 11.1). The engraving depicted a happy father directing his son's gaze towards the desirable sight of his mother breastfeeding. In the bottom left corner, a little girl practices breastfeeding on a doll.

Besides such moral and paternalistic attitudes towards breastfeeding, physicians touted the salubrious advantages of lactation. As the German physician



Figure 11.1 "Mother" in Johan Hendrik Swilders *Vaderlandsch A-B Boek*, Amsterdam, 1718. Courtesy Amsterdam Rijksmuseum.

Albrecht von Haller noted, the flow of breast milk supported the health of the mother, too, because it would save her from a certain degree of discomfort:

> Most women of quality imagine they shall preserve their beautiful shape by not suckling their own children. But we ought not to presume ourselves wiser than nature, who never changes her laws with respect to the fabric of the human body. … [T]hose who suckle their own children have a less discharge of the lochia, and have all the symptoms of their lying-in milder without any return of their menses so long as they suckle.
>
> (von Haller, 1739–1744, pp. 5.439–5.440; 1742–1746, p. 5.210)

Von Haller here referred to the balance between lactation and menstruation, or the "menstrual flux" as it was called. In Galenic humoral theory, breast milk was thought to be produced from the menses, rising from the uterus to the breasts in the latter stages of pregnancy. As the menses was further "concocted", the fluid changed colour from red to white. While in von Haller's time this physiology was reformulated as milk developing directly from the blood and chyle – making milk and menses entirely separate fluids and emissions – the end result was the same: a healthy balance of retention and excretion meant monthly emissions outside pregnancy and lactation; and whenever menstruation and lactation occurred simultaneously or not at all, it was a sign of ill health (Gaubius, 1778, pp. 315–316).[4] Young mothers were therefore advised to breastfeed, for the benefit of their child as well as their own health.

Many women did – some even with too much enthusiasm – it appears. Physicians spoke of excessive lactation whenever a mother produced more milk than her child required. The wife of the English physician Humphrey Ridley (1653–1708) was said not only to have breastfed her own two children but also a number of dogs, and made one and a half pounds of butter of the remaining milk (Bicker, 1763, p. 111). Although such extreme cases may be dismissed as fantastical, the Rotterdam physician Lambertus Bicker (1732–1801) did observe the case of a mother who suckled her own child and was able to fill three wine bottles with breast milk a day (1763, p. 111). Physicians attributed this plethora of milk to a combination of factors: on the one hand, a mother's particular physique, such as a weak and moist temperament and large breasts, while, on the other hand, her lifestyle choices, including the consumption of too much food and drink and a sedentary life. The non-naturals of food and drink as well as movement and rest could thus directly impact lactation.

Some eighteenth-century women were such enthusiastic breastfeeders that excessive lactation endangered their life. Professor of medicine and chemistry at Leiden Hieronymus Gaubius (1705–1780) listed an entire series of possible disorders: "The lacteal excretion, when greater than the strength of the nurse, by withdrawing the nutriment of the body, creates debility, wanness, emaciation, a fluctuating circulation, hectic fever, consumption, profuse sweats, abortion" (1778, p. 196). A case history Albrecht von Haller shared with his

students offers a good example. A caring woman from the city of Dordrecht had borne and suckled her children for 12 years without interruption, one after the other. At this point she began to suffer from an immoderate flow of milk, which von Haller called "lacteal diabetes": whenever she drank and ate, her breasts would start to leak, even without any suction. "If she drank a pint of ale there was almost the like quantity of milk evacuated from her breasts", von Haller reported (1742–1746, p. 3.143).[5] In this case, the woman not only lactated more than her child required, she also lactated beyond what her body could sustain, hurting her vitality. Unable to retain any nourishment, the woman from Dordrecht slowly wasted away. Von Haller decided she needed a long rest to enable her to retain sufficient nourishment, and after nine months of illness the woman was cured. Although this case may be far from coincidental, von Haller's approach clearly demonstrates that physicians continued to advocate a balance between excretion and retention.

The risk of lacteal diabetes and exhaustion could be easily prevented by means of a controlled, healthy retention. The advice among women to stop breastfeeding was therefore not uncommon. Grandmother Johanna Maria van Steensel, for example, urged her daughter Christina (1758–1801) to moderate her breastfeeding sessions. "Dear daughter", she wrote, "don't give your child suck so much, but wean it during the day; it will grow better and you can once again go out and it is now so old that it can eat" (Dik and Helmers, 1994, p. 88). By this time, Christina had been giving suck to her son Frans for almost six months. She did not listen to her mother, however, as we learn from a letter a month later:

> You had better take your convenience and do not suckle your child during daytime, please do yourself some good. I know your character and fear that you do not take care of yourself, so provide for yourself in eating and drinking.
>
> (Dik and Helmers, 1994, p. 91)

The concern for Christina's health and well-being, in other words, was enough reason for her to stop breastfeeding and start accustoming her baby to the hand feeding of porridges.

But whereas *healthy* retention could support a mother's health, an *unhealthy* retention could result in serious diseases, ranging from breast swellings to milk fever. On 7 July 1780, Aagje Luijtsen (1756–1797) described to her husband (who was on a mercantile expedition to China) what appears to have been a breast infection. Having just delivered her second son Klaas, Aagje experienced swelling in one of her breasts:

> My anxiety has not been in vain, for I have again had sad thrust [urge of lactation] out of my one breast. It has swelled twice and now that it has stopped swelling there is a lump in my chest like a fist, so that I am now embarrassed, but I keep God in mind, that he is the only helper in time of need.
>
> (Moree, 2003, pp. 173–174)

Two ship surgeons who examined Aagje suspected cancer and advised her that, if compresses did not work, she had to travel to Amsterdam to have it removed. Fortunately for Aagje, however, her breast slowly returned to normal. When writing again to her husband on 30 August, she noted that "I think the lump is getting smaller and I sincerely hope it will recover. I do have courage now[,] I steadily keep patches on it and I have the least pain" (Moree, 2003, pp. 173–174).

Other women, too, experienced an unhealthy retention of breast milk in the form of fever. In 1787, in Nijmegen, for example, Johanna Helena Halfman (1759–1829) gave birth to her son Justus de Vrij, but she suffered from the so-called *febris lactea* or "milk fever". Milk fevers were generally believed to be caused by a surplus of breast milk ascending inside the body but not secreting properly. As Johanna confided to her friend Christina,

> with regards to the milk, it did not come up until the 5th day and it was not much, but I have had a rise or three milk fevers and no milk came any more. I thus have to feed the little Jus with porridge, because I'm very much against a wet nurse.
>
> (Dik and Helmers, 1994, p. 94)

Physicians disagreed on the exact occurrence and cause of milk fever. Michael Ernst Ettmüller (1644–1683), a physician in Leipzig, argued that the fever was caused by general weakness, continuous lochia or discharge from the uterus after childbirth and other excretions. William Cadogan (1711–1797), however, a physician from Bristol, deemed milk fever to be caused by harmful lifestyle choices. He argued that because newborns are fed porridge too quickly, their hunger is stilled and they no longer eagerly suck the milk from their mothers' breasts, resulting in excessive retention and ultimately a milk fever in the mother (Cadogan, 1750, p. 15).

In short, the concept of excretion and retention shaped the way people in the period understood the flows of breast milk and female health. While doctors and women unanimously agreed on the need for the right balance between excretion and retention, they could differ in opinion on where and how this balance was to be found.

The chemistry of milk

Because there was a profound need for more effective therapies to remedy lacteal disorders, it comes as no surprise that the Holland Society of Sciences launched a prize essay competition on the subject. Around 15 submissions to the call of the Holland Society were written by apothecaries, surgeons and physicians, mostly from across the Low Countries, such as Abraham Tersier (c. 1713–1769) from Dordrecht and Lambertus Bicker from Rotterdam. Some of the contestants' essays reflect important developments at the time: they demonstrate that the discipline of chemistry was expected to provide new medical

insights. Going beyond the external observation of the flows of milk, chemistry increasingly informed the internal physiology of lactation and the pathology of lacteal disorders. The maintenance of life and the restoring of health, in other words, were now increasingly supported by chemical investigation.

That chemical knowledge of milk was reflected in the essays was no coincidence. When in 1733 Tersier matriculated at the University of Leiden, chemistry was in full swing. Professor Herman Boerhaave (1668–1738) had just published his long-awaited chemical textbook *Elementa chemiae* (1732); the young and newly appointed Hieronymus Gaubius was an eager and enthusiastic lecturer of chemistry; and experiments in the chemical laboratory were supported by a new assistant, Abraham Tijken. Professors and students alike performed experiments on plants, minerals and bodily fluids.[6] As part of this push to chemically analyse the natural world, physicians also applied chemistry to prove and emphasise the merits of milk.[7]

The chemistry of milk greatly contributed to new understandings of physiology. To begin with, chemical inquiry into milk yielded insights into maturation and nutrition. In one of his experiments, Boerhaave added an acid (such as the spirit of nitre) to a quantity of fresh cow's milk. He then started boiling the mixture on the stove, and, although no ebullition appeared, the mixture divided into separate thin and thick parts. This process illustrated the formation of curd from milk, from which then cheese could be made. Boerhaave used this demonstration to teach his students that the extraction of moisture from the coagulum by means of pressure and evaporation would turn it as hard as stone: "When applied to the fire it grows tough, scorches, fries and smells perfectly like horn. This is a strange change of so fluid a matter as milk! But is it not *the origin of all the solids in the body*?" (1732, p. 2.301; 1741, p. 2.188).[8] Milk, in other words, could transform into any body part, including solid bones, making it the perfect nutriment.

Furthermore, the apparently mundane fluid of milk was at the heart of one of the woman's most important physiological process because it was the result of digestion and secretion, unique to mothers. According to Boerhaave, all animals fed on vegetable matter, either directly as herbivores or indirectly as carnivores eating other herbivores. Humans, in turn, ate those animals, which led him to conclude that "all our nourishment is therefore vegetable juices, prepared by the action of one or more stomachs, according as they are drawn either immediately from the vegetables themselves, or from the broken fibres and vessels of animals" (von Haller, 1739–1744, p. 1.272; 1742–1746, pp. 1.224–225). The next step involved analysing that fluid, which was in the process of losing its "vegetable nature" and maturing into having an "animal nature". "This part must be such a fluid", Boerhaave explained,

> as proceeding originally from a vegetable, has felt the vital forces of the body, mixed with the blood, passed thro' the arteries and the veins, and been soon separated again. And this can be no other than chyle from vegetables, turned to milk, and separated in the breasts.
>
> (1727, p. 2.180)

In other words, once a mother chewed vegetable matter, it mixed with her saliva. Once in her intestines, the chyle would combine and circulate with the bodily fluids as an "emulsion", to be separated eventually in her breasts as a white, oily substance called milk (Boerhaave, 1727, pp. 2.181–182).[9]

The lectures on milk were eagerly taken up by students because they supported their knowledge of female physiology and health. One of them, Henricus Doorschodt, performed multiple chemical experiments on milk. He put fresh milk in a glass alembic and slowly distilled it, gathering a simple water that smelled and tasted like milk. By applying a more "violent fire" to this distillate, Doorschodt was able to gain insight into the "chemical principles of milk" (1737, p. 16). One of these properties of milk was its watery nature. Doorschodt boiled the milk and, for precision, used a mercury-filled thermometer on the Fahrenheit scale to keep track of the temperature.[10] Although milk was twice as thick as water, it reached boiling point around 212°F, i.e. at the same point as water. From this in vitro experiment Doorschodt concluded that milk had a watery nature and that in vivo "milk in blood will never rise to this degree of heat, nor, indeed, in the highest degree of fever" (1737, pp. 16–17). Experiments on milk in the laboratory were thus believed to give direct insights into the behaviour of milk in a woman's body.

Indeed, as students acquired specialist chemical knowledge on the nature of milk, they soon began to relate their insights to lacteal disorders. For example, students linked the cause of milk fever to particular kinds of food. Doorschodt knew that wealthy parents could afford to eat meat. As this was predominantly alkaline, he added an alkaline salt to fresh milk and started raising the temperature. He closely observed colour changes, from white to yellow, all the way to deep red (Doorschodt, 1737, p. 19). This suggested that when milk circulated in the body without enough acid, the milk could not turn sour and putrefy, causing obstructions and fevers. A change in diet was regarded the best course of action: the consumption of more vegetables in case of a meat-heavy diet, and of more meat in case of a predominantly vegetable diet, and this diet was to be followed until the colour of the milk of mother or nurse had returned to a perfect white (Boerhaave, 1741, pp. 2.184–2.185). Additionally, Doorschodt believed that water could homogeneously combine with milk without causing any sourness, and so he advised that when "the thickness of milk is wrong in the nurse, a watery diet is prescribed" (1737, p. 20). Chemical experiments on milk, in other words, explained its pathologies and directed physicians to concrete dietary advice.

The jury of the 1760 prize essay competition did not deem Abraham Tersier's submission good enough to be awarded the Society's medal.[11] Tersier nonetheless decided to publish his dietary advice for increasing and reducing lactation (1762). In addition, he incorporated the Boerhaavian chemical discourse on milk in the form of his favourite genre: poetry. Entitled "Letter to the very noble, Lord N.N., containing a discourse on milk", the poem versified chemical experiments mixing milk with acids and alkalis. To help the

reader, Tersier made a direct reference to Boerhaave's chemistry textbook and concluded:

> Chemistry, not satisfied with external observation,
> Wants to uncover all it encounters, from part to part,
> And clearly show by plentiful experimentation
> The nature and force of the intimate existence.
>
> (Tersier, 1768, p. 5)

Galactagogues and evacuants

In 1762, two years after having launched the essay competition on how to increase and suppress lactation, the Holland Society of Sciences awarded the gold medal to the Paris physician Jean-Pierre David (b. 1737), and the silver medal to Lambertus Bicker (de Bruijn, 1977, pp. 35–36).[12] Once the awardees had made their essays available as separate, stand-alone publications, the reading public beyond the Society learned about their take on the treatment of lacteal disorders. Going beyond dietary advice, these treatments mainly involved evacuants, i.e. medicines that induced all kinds of bodily discharges. While measuring the impact of Bicker's and David's work is difficult, it is telling that both authors were often cited in subsequent studies on milk.[13] Furthermore, Bicker's *Zog der vrouwen* ("The Milk of Women") was advertised in three instalments in the newspaper *Opregte Haerlemsche Courant*, on 25 October, 1 and 15 November 1763, and received a laudatory review in the *Vaderlandsche letter-oefeningen* ("Fatherland's Literary Exercises"), one of the most prominent Dutch literary journals (Anonymous, *Vaderlandsche letter-oefeningen*, 1764, pp. 201–212).

To answer the question of how a sufficient supply of breast milk could be achieved, David and Bicker used chemical knowledge and evaluated the contemporary use and efficacy of galactagogues, i.e. substances stimulating and increasing the flow of mother's milk. While the use of various herbs and minerals proved popular throughout the early modern period, this section shows why eighteenth-century physicians tended to promote milk-based products as more effective lactation stimulants. Acknowledging that herbal galactagogues continued to be used, David and Bicker nevertheless encouraged mothers to use lacteal products to augment their milk production and lactation.

In the seventeenth century, galactagogues were almost exclusively derived from herbal and mineral sources. A Dutch series of household manuals titled *Het vermakelijck landt-leven* ("The Pleasurable Country Life", 1683) included recipes to remedy breast infections and painful nipples. The very first medicine recorded here for mammiform disorders was devoted to the increase of lactation:

> To increase the milk in the breasts: Take a half loot [1/4 oz.] aniseed or fennel seed, drink it with cabbage juice when going to bed, or mix green fennel and dill with barley water; make it sweet with sugar and drink it.
>
> (van der Groen, 1683, p. 16)

The ingredients for these remedies were all herbal in nature: seeds of anise and fennel, dill, coriander and mint. Although these galactagogues could be made at home, even from herbs grown in one's own garden, the list of ingredients does not differ greatly from recipes recorded in other pharmacy books and pharmacopoeia. For example, the famous pharmacopoeia by the Flemish physician Robert de Farvacques (fl. 1600–1637) stated that milk-making medicines (*lac generantia*) "are of a nature, which are drawn out of the best nourishment of food and drink, as some do such proficient medicines, which are of thin and fine parts, and naturally hot, such as fennel, dill, chick pea, onion" (de Farvacques, 1741, p. 1.21). Another such book, the *Nieuwe Nederduitsche apotheek* ("New Netherlands Apothecary", 1753), promoted ingredients such as lettuce, oregano and sow thistle (*sonchus oleraceus*), also known as milk thistle because of its milky sap (*Nieuwe Nederduitsche Apotheek*, 1753, pp. 26, 29, 34).[14]

Recipes for herbal galactagogues continued to circulate in eighteenth-century treatises, but they no longer constituted the primary solution for a lack of breast milk. Jean-Pierre David's winning essay lists a number of treatments to first support the flow of fluids towards the mother's breasts. The main aim was to increase the "fullness of the veins" through good nourishment, an avoidance of heavy physical activities to prevent excessive perspiration, armbands to keep the blood in the torso as much as possible, bathing in warm water and many other treatments (David, 1763, pp. 24–28). David ended his elaboration on treatments with the suggestion that "one can add the use the seeds of anise, fennel, caraway and dill, of which some authors say it is beneficial in promoting the milk of women" (1763, p. 30). In other words, while David was aware of the well-known herbal galactagogues, they were merely mentioned in passing as alternative treatments to the detailed dietary prescriptions and externally applied treatments.

Lambertus Bicker concurred with David that anise, fennel and other carminative seeds could be consumed for the promotion of lactation, yet he preferred "foods rich in chyle", such as milk, whey and cream. Alternatively, one could prepare porridge by boiling bread, barley, oats, groats and rice with milk, beer or water (Bicker, 1763, p. 108). Yet as far as Bicker was concerned, mothers had to strictly abstain from galactagogues of a mineral nature, such as the so-called "milk of the moon" (*lac lunae*). One fervent supporter of moon-milk had been Johann Daniel Major (1634–1693), the Professor of Medicine at the Christian Albrechts University in Kiel, where he taught medical theory, botany and chemistry. According to Major, the substance of moon-milk, which was found in silver mines, derived its name from its white and shiny appearance:

> Silver is indeed known as a gift of the Moon, just as iron stems from Mars, gold from the Sun and other metals or minerals from planets which lend them their names because sympathies persist between certain heavenly objects and subterranean substances.
>
> (1767, cited in Moran, 1999, pp. 33–34)

Moon-milk was therefore thought to originate from the moist effluvium of the moon, and its sticky and pasty texture was similar to that of soft cheese made from unskimmed milk and cream, hence moon-milk.[15] According to Major, moon-milk worked best as a galactagogue when harvested at full moon and taken together with the juice of herbs, such as thistle, fennel, parsley, anise or basil. A century later, however, Bicker radically dismissed the use of moon-milk as a false galactagogue: "Because everything which is here prescribed as peculiar milk-making medicines, similar to the notorious milk-stone and others, I regard to mere fables and superstitions based on a deceptive imagination" (1763, p. 108). Although moon-milk appeared to have many of the same external characteristics and much of the appearance of milk, this example of sympathetic medicine was falsified by experience, and moon-milk was dismissed as a false galactagogue. Based on eighteenth-century chemical understandings of milk, such as those of Boerhaave and Doorschodt, physicians and apothecaries promoted chylous galactagogues as aids for a sufficient supply of good-quality breast milk.

In addition to the chemically informed galactagogues and evacuants, physicians also developed mechanical solutions by constructing new devices. In the second part of the eighteenth century, they began experimenting with so-called "breast pumps", which mechanically expressed the milk from the breasts and collected it in a glass receiver. In 1773, George Wilhelm Stein (1737–1803), the physician and Professor at the Collegium Carolinum in Kassel in northern Hesse, collaborated with the instrument maker Johann Gottlieb Stegmann (1725–1795) to develop the "breast or milk pump", which mechanically drew milk from a mother's breasts into a glass receiver (Stein, 1773; Stegmann, 1774).[16] Various devices to assist the external extraction of milk from the breasts were already in use by that time. Nipple cups, for example, had the shape of thimbles and elongated the nipple, making breastfeeding less painful for the mother and easier for the baby to suck.[17] Breast relievers or glass bowls were used to provide suction, but because they had very little suction could only collect surplus milk. This led to the development of a tobacco pipe-shaped instrument made of glass, called the "Milchsauger" ("milk-sucker"), by which a woman could apply suction to her own breasts (see Figure 11.2) (Sturm, 1676, p. 2.56).[18] Stein however, was not satisfied with this device, for it required the mother to perform physical exercise which could be too exhausting. When he observed that his colleague Stegmann was experimenting with English vacuum pumps in his workshop, Stein struck upon the luminous idea to create a "machine that sucks" milk mechanically. Stegmann took an ordinary breast glass, made an opening in the top centre and screwed on a brass cylinder vacuum pump. After various trials, he perfected the design with valves and seals (see Figure 11.3).[19]

According to Stein, his breast pump exceeded all expectations. It shaped the nipple, drew milk from the breasts more effectively and more forcefully than earlier models and it was believed to treat and prevent milk fever, since the breasts were fully emptied. News about this innovative technology soon



Figure 11.2 Milk-suctioner in Johann Sturm, *Collegium experimentale* (Nuremberg, 1676). SLUB /Deutsche Fotothek.

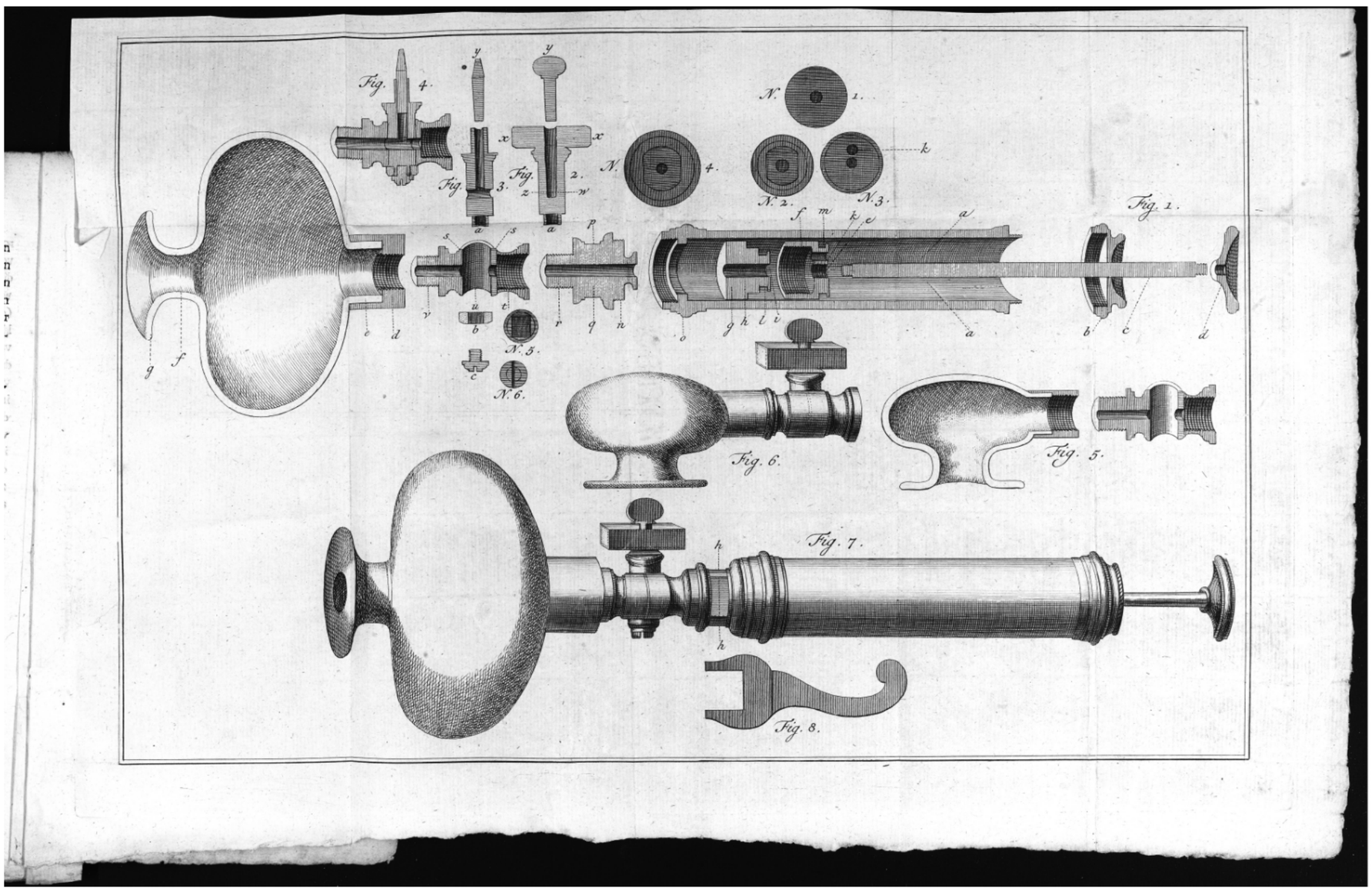


Figure 11.3 Breast or milk pump in George Wilhelm Stein, *Korte beschryving eener borst- of zog-pomp* (Utrecht, 1775). Amsterdam, University Library, O 01-1826.

spread to the Dutch Republic, where Stein's treatise was published in translation and, together with the instrument, advertised in newspapers (Stein, 1775, see Gallandat, 1786). The pumps were very expensive, however: a simple tin breast pump cost 12 guilders, and a more elaborate and beautiful brass pump 16 guilders.

Although it is likely that only well-to-do women like Maria Meinertshagen were able to afford this instrument, its invention nevertheless underscores contemporary physicians' commitment to find solutions for lactation problems. Learned societies played an important part in this, explicitly aiming at generating and encouraging the production of knowledge that was of benefit to women and society at large. Physicians emphasised the benefit of cheese, butter, beer and other chylous galactagogues over that of herbal and mineral medicines for addressing milk flow problems – a claim supported by knowledge of the chemical qualities of milk. Besides encouraging the production of mother's milk through the ingestion of dairy products, its expression from the breasts was also promoted via new technologies, such as milk pumps.

Conclusion

Throughout the early modern period, the non-natural retention and excretion formed an essential part of the healthy, female body. The secretion of the nourishing fluid of breast milk formed a special case in comparison to other excretions, because it was not simply a matter of getting rid of harmful substances. Mothers sought the right balance between retention and secretion of milk, as it was the key to their health: excessive lactation could lead to general weakness, while excessive retention could cause breast swellings and milk fever. Based on letters and diaries, women shared their breastfeeding struggles and experiences. These sources testify to the continued importance of the notion of balance between retention and excretion.

As this chapter has shown, the eighteenth century witnessed a stream of lacteal knowledge. From numerous books, treatises and essays, it is clear that physicians were much inclined to support the physical health of mothers. In the eighteenth century, chemical investigations into the properties of milk supported physiological and pathological understandings of the process of lactation. The foundation of scientific societies, such as the Holland Society of Sciences in Haarlem in 1752, stimulated the utilisation of lactational knowledge in society. Indeed, based on new chemical insights, pharmaceutical and dietary advice shifted towards chyle-rich products and ingredients. Simultaneously, mechanical instruments were devised to support the healthy flow of breast milk.

Though no one would deny the importance of female health, some authors were more prone to prioritise women's well-being over their ability to breastfeed. Instead of solely focusing on the physical expressions of motherhood, female authors like Elisabeth Bekker (1738–1804) and Félicité de Genlis (1746–1830) emphasised the mental well-being of the mother and the education of children. In one of her earliest works, Bekker encouraged her readers

to think differently about motherhood. Healthy lactation and giving suck was not at all a point of contention. Mothers should not doubt or worry about breastfeeding, but instead embrace their natural talent to love, care and educate because they were ideal for teaching confidence and joyfulness to their children. The main aim of motherhood, according to Bekker, was a woman's happiness and her ability to run a household (1779). Madame de Genlis, similarly, argued that a mother would do better not to suckle her child than to do it poorly. Both mother and child were better off when, in such circumstances, the child was left with a caring wet nurse who stayed home all day to take care of the infant (1782–1783, pp. 1.105–1.108). Female authors, in other words, tried to influence breastfeeding lifestyles. Surely many mothers breastfed their children. But whenever they were unable to do so, Bekker and de Genlis dismissed the motion that this physical shortcoming meant failing one's "maternal duty". Instead, they gave prominence to female well-being and to motherhood as the task of caring, protecting and educating.

Notes

1 On the historical context of Dutch learned societies, see Mijnhardt (1988); Kloek and Mijnhardt (2004).
2 On Maria Meinertzhagen's life, see van der Meulen (1998, pp. 107–112); Kloek (2013, pp. 661–662).
3 On Swildens, see Hake (2004).
4 On menstruation, see McClive (2015).
5 Others solely used the term "lacteal diabetes" when milk appeared to flow from the urethra.
6 Rina Knoeff has argued that Boerhaave stimulated his students to think, observe and experiment themselves, rather than to repeat the Professor's words and apply ready-made courses of action to a problem, see Knoeff (2010).
7 On the study of bodily fluids by chemistry, see Verwaal (2017a, 2018).
8 Emphasis added.
9 On Boerhaave's business of chylification, see Orland (2012).
10 Boerhaave had integrated Fahrenheit's thermometer in his chemical lectures, and other chemistry instructors followed suit, see Powers (2014).
11 The jury consisted of J. Engelman, Hieronymus Gaubius, Joannes Grashuis, Jacobus Hovius, P. Sannié, and Thomas Schwencke, see de Bruijn (1977).
12 The golden medal awarded to monsieur David was designed and made by Amsterdam goldsmith Marchand, see Louis Marchand to C.C.H. van der Aa, Amsterdam, 18 June 1762 in Noord-Hollands Archief (NHA), 444, Hollandsche Maatschappij der Wetenschappen te Haarlem, 1752–1975, no. 373.
13 For example, David and Bicker were both referenced in Thorvarth (1764, pp. 19, 30–31, 33). Readers were directed to Bicker for all children's diseases relating to milk in the Dutch edition of von Rosenstein (1768, p. 52).
14 This work listed Boerhaave's and Gaubius' chemical preparations, or so the preface argues.
15 Today, moon-milk is known to be a white deposit consisting of carbonate materials, e.g. calcite, hydro-magnesite and gypsum. It is slowly formed in caves of aggregates of very fine crystals of varying composition.
16 On the issue whether Stein or Stegmann had first invented the pump, and on its commodification in France, see Carlyle (2017).

17 A nipple cup or "petit chaperon" looked like a little thimble and was a well-known device among midwives, see Mauriceau (1682); Dionis (1718, p. 358); Mesnard (1743, p. 357). Ordinary nipple shields were often made of tin. More luxurious versions were made of silver, glass or ivory, such as A641255, A606830 and A606829, c. 1800, Wellcome Library, London.
18 See for example A606855 and A606862, Science Museum, London.
19 Eighteenth-century breast pumps are still extant in museum collections today. See, for example, A124874, Science Museum, London, and V05517, Rijksmuseum Boerhaave, Leiden.

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Part 6

Passions and emotions



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12 Feel-good tunes

Music aesthetics, performance and well-being in the eighteenth century

Wiebke Thormählen

Introduction

Music's powerful visceral effect on the body and mind was of great interest during the eighteenth century; sometimes it even became a source for moral and medical concern. In the extensive aesthetic writings of the second quarter of the century, it became a commonplace as much as an artistic demand that music should move the passions, one that acknowledged the "felt effect" of music. Writers on music sought to explain the causes of common emotional reactions to music and they attempted to outline how music's seemingly inescapable power to stir something inside each individual could be put to effective use. While much secondary literature on the subject has focused on the different models used to explain music's effect, the connection made between music and the passions has its own story to tell: in the eighteenth century, explanatory models for music's powers assume music's impact on the passions in a way that influences both physical and mental health. What's more, through a regulation of the individual's access and exposure to and manner of engagement with music, the passions were deemed to be regulatable through music. James Kennaway notes in Chapter 13 that the idea of regulation and control relied on particular mental and physical regimes. Music was co-opted into these regimes as both a physical and a mental activity.

In this chapter, I will show that a fundamental shift in the discussion of music from a mathematical, universal phenomenon rooted in the belief in a cosmic harmony to music as a mode of human interaction and communication forced writers on music to borrow inevitably from medical discourses in an attempt to find means of articulating and, crucially, regulating the power of music. The move to replace music's ontology as the centre of enquiry with its individual and collective perception formed part of a larger reconceptualisation of the arts within a secular framework for moral health and civic duty. Aesthetic writings on music began to borrow the concepts of balance and, more significantly, moderation so as to control music within the bounds of what came to be seen as its artistic, medical and social purpose. The discourse surrounding the establishment and retention of moral health borrowed heavily from the current discourse on physical health; its language was strongly indebted to dietetics as

expressed in medical writings such as those of Hermann Boerhaave, Thomas Sydenham and George Cheyne. Musical writers, in defending the purpose of music, borrowed from modish ideas on regimen in particular. At first two of the non-naturals are considered here – physical exercise and the passions – but it was the latter that rose to prominence as the single most significant catalyst through which music influences health in body and mind. By applying the concept of moderation ultimately to both the engagement with music and the compositional nature of music itself, music could become a powerful tool in the regulation and control of the passions; by borrowing the idea of dietetics, writers could move from having to control the passions of music to controlling the passions through music.

The long eighteenth century is special for a variety of reasons: music, of course, had always been part of human life. Singing and playing instruments were part of social activity, but this activity took on new guises with the advent of a rapidly developing culture of music printing that allowed a dissemination of composed music at a vastly increased rate. Large-scale, organised public music was increasingly taken out of the church and made accessible to a larger public in theatres and eventually concert venues, a development that mirrored a fundamental recasting of music's epistemological status. While the idea of music as a science pertaining to the order of sounds had long since made way for the humanist conception of music as a sounding practice, well into the eighteenth-century music's effects were nonetheless rationalised in mathematical calculations that could demonstrate scientifically what had once been held as spiritual, even religious belief in a cosmic and therefore universal order. Since the early seventeenth century, however, parallel conceptions of music emerged that sought to explain music's indisputable effects through the mechanistic impact that sound itself had on the human body. Quasi-medical explanations of music's effects were aligned with theories on the Galenic humours in which the sounds set fluids in motion and thereby impacted the passions, and with a Newtonian hydraulic system, before being reconceptualised within the fashionable discourse on nervous stimulation (Kennaway, 2012).

Within these discussions of music and the body, music was conceived of in two ways: on the one hand, as a possible therapeutic tool that could aid the cure of various ailments, physical and mental; on the other hand, as potentially dangerous and a threat to health in the widest sense. In music aesthetics, the latter view assumed a driving force: music, in contrast to the other arts, appeared to have an immediate physical impact that was independent of the realm of reason and cognition, a fact that resulted in classing music as the lowest of the arts (Lipking, 1970; Hosler, 1981; Neubauer, 1988). Broadly speaking, in the absence of a universal truth within a work of art (as in science), art was adumbrated as gaining value and meaning by mimicking nature. This mimesis was ideally both obvious and profound. Whereas words could describe scenes of nature that paintings imitated easily in their depiction, music lacked such clear mimicry at a profound level, as only sounds per se – the call of a bird or the

roar of thunder – could easily and unambiguously recall nature. Sounds, then, were capable of mimesis but music was not.

Music's unmediated impact on the body and on emotions, then, posed a problem. Writing in 1771, the German writer and aesthetician Johann Georg Sulzer stipulated that "the primary purpose of the arts must reside in awakening a lively feeling for the beautiful and the good, and a strong repulsion towards the ugly and the evil" (1792–4, p. xiii). The proposition formed part of the preface to his comprehensive discussion of the arts in the *Allgemeine Theorie der schönen Künste*, a book that would eventually stretch to four volumes. Its sole purpose was to explain how the different arts could fulfil their particular role of aiding the moral education of man and the honing of his "societal virtues" (*gesellschaftliche Tugenden*).[1] Music was but one of the arts explored to this effect. The triumvirate of the true, the good and the beautiful was central to the Enlightenment's reception of the ancient writers, and Sulzer, here, was indebted particularly to the British empirical thinkers' reception of the ancients. He adopted the idea that men and women possessed inner senses responsible for acting morally and for desiring to live and function in social groups (Thormählen, 2015; Friday, 2004). Their existence was manifest in the parallels that could be observed between the natural reactions evoked by the sight of beauty and those brought about through sympathy with other creatures (Barker-Benfield, 1992; Mullan, 1988; Shaftesbury, 1999; Hutcheson, 2004; Smith, 2010). These reactions, in their raw state, were seen as a combination of sensory perceptions and material processes, and were described as passions, affections, feelings and later emotions (Alberti, 2006). The material reactions indicated the existence of the inner sense of morality and sociality; yet, to fulfil their proper function in the social life of man, these senses, just like the senses of hearing, seeing, taste, etc., had to be educated. Following the Lockean model, widespread in eighteenth-century English and Scottish thinking and influential in Germany, writers generally agreed that this education was a matter of rationalising the material processes that resulted from sense perceptions experienced by and through the body. The arts were the proper medium to rationalise, exercise and to hone the inner sense of morality and sociality (Brown, 1951; Fischer, 1975).

When Sulzer and his contributors grappled with the felt effect of music, attempting to describe and define its meaning, they tried to mould music into a form of art that could refine man's inner senses and contribute to his moral education. Sulzer's preferred mode of exercising control over and rationalising music was no longer based in recourse to its scientifically ratifiable harmonic structure; instead, he – like many others before and with him – sought to control music's effects by claiming for music a status akin to a language, with music (properly constructed) capable of communicating powerful emotions that were felt physically and that had to be rationalised through large- and small-scale compositional order on one hand and through combination with words on the other. Granting the proper setting of words to musical structures, music was uniquely capable of communicating (the) emotions (that lay behind

the rationality of words). But music *had* to be combined with words so as to be effective, meaningful and useful. Music's physical effects alone, in contrast, were dangerous.

Beyond the language-based model, however, various other explanations existed that would bring music's powers under control in terms of regimen and moral order. They shared one significant aspect with the language model that must remain in focus: they were all born of the fundamental reconceptualisation of music as a communicative tool – a tool no longer rooted in a divine or cosmic harmony but one that communicated directly to the passions, a move that shifted the human to the centre of scientific and moral investigation of music.

The ontology of music and its compositional particulars (hitherto the subject of theoretical treatises on music) were cast aside for the investigation and discussion of effect. While over the course of the eighteenth century, as we will see, the idea of how music stimulates the passions moved from a somatic experience to a quasi-psychological one (or one of the mind), the idea of moderation and balance so crucial in the theories of the six non-naturals was retained throughout. With this, the idea of dietetics remained constant but was gradually transfigured from a physical, mechanical model to a conceptual one: music's primary purpose was the raising of the passions, yet the definitions of passions themselves shifted over the course of the century from material processes to psychosomatic states. It is telling that this reconceptualisation did not result in radical new ways of affecting the passions; on the contrary, the main means to affect and control passion and emotions remained stably defined in language and ideas borrowed from the medical discourse on physical health and regimen. When it came to music, a moderate stimulation of the passions, achieved through the experience of sound in motion, i.e. music that followed a logical, comprehensible progression, was the ideal means to regulate a person's passions and thereby keep him/her in a state of health.

Charles Avison's celebrated *Essay on Musical Expression* of 1752 presents a case study for a treatise on music's powers and, ultimately, for its purpose in society. Avison advocated moderation as a key aspect of the art of music. His ideals of moderation stood in contrast to the emerging theories of the sublime as a central category of art's effects. Avison's ideals were steeped in the medical rhetoric of temperance and balance that was central to the theories of the non-naturals. These theories were gradually supplanted in medical theory, but they would hold sway in the popular imagination well into the nineteenth century as is avowed in conduct manuals and educational pamphlets. Avison's concern, was with only one of the six non-naturals: the passions of the soul, yet as we will see the act of engaging with music and particularly making music was directly linked to music's powers over the passions of the soul. His treatise, however, no longer promoted music as a therapeutic tool that would cure physical ailments.

Music as a tool towards regaining and retaining actual physical health in terms of regimen had, in contrast, been part of the earlier eighteenth-century conceptualisation of music's effects. One of its early formulations was the

popular tract *Medicina Musica* by the apothecary Richard Browne, first published anonymously in 1723 and republished under the author's name in 1729. Browne, in contrast to Avison, the organist, music teacher and founder-director of the Newcastle Music Society, was a mere musical amateur. His discussion of music was overtly related to the physical health of a body that he understood as a hydraulic machine driven by animal spirits. He discussed the act of singing as a quasi-exercise that had beneficial effects on the body and that therefore aided the retention of health. While it alone could not cure diseases, Browne explored it as a handmaid in the cure of diseases. As such, music had therapeutic qualities in Browne's view that Avison no longer believed in. While Avison, writing 25 years later, did not subscribe to the idea that singing as a physical exercise keeps one in good health, we will see that the act of music-making nonetheless played a significant role in his theories of balance as well. Music-making became an essential part of the temperance of the passions of the soul and with that of the mind.

Both Browne's *Medicina Musica* and Avison's *Essay on Musical Expression* borrowed from dietetics insofar that both authors agreed that repeated exposure to music would aid the development of sensibility to its effects and thereby allow music to act on a person's mental and moral health. Both formulated music's efficacy in a manner that was independent of the linguistic model that Sulzer proposed and that is today commonly seen as the dominant eighteenth-century model (Hosler, 1981; Bonds, 2014); both defied the idea of imitation of verbal and rhetorical structures, and the idea that music gains meaning only through the accompaniment of words. Instead, both Browne's and Avison's models highlight the significance of melody itself as the particular musical parameter responsible for music's ability to create sympathy as they considered the invention and proper execution of melody as tools to exercise the passions of the mind in powerful ways.

Moving the passions: Charles Avison's *Essay on Musical Expression*

Avison wrote in his *Essay on Musical Expression* (2004a, p. 6):

> By the Musician's Art, we are often carried into the Fury of a Battle, or a Tempest, we are by turns elated with Joy, or sunk in pleasing Sorrow, roused to Courage, or quelled by grateful Terrors, melted into Pity, Tenderness, and Love, or transported to the Regions of Bliss, in an Extacy of divine Praise.

With linguistic aplomb, he here confessed to the strong belief that music can simulate passionate states, and that these are the theme of his exploration. How did music achieve these effects? In answering this question, it is significant that Avison did not turn to writing a compositional treatise that provides rules to achieve particular effects, nor did he write a whole-hearted critique of current

styles. Instead, he focussed on the process of "being put into" a state of passion, a process that cannot be explored with recourse to a musical work but only with recourse to the perception of music.

Avison devised his treatise for the general public, a move that set him apart from the more common technical and specialist writings on music aimed at a readership of professional musicians and theorists. Avison consulted with a number of his amateur musician friends and addressed the lovers of music who, in their being affected by music, were the actual subjects of his investigation. His significant acknowledgement, then, was that "the public Inclination for Music seems every Day advancing" – his opening statement to the book – and that therefore this inclination needed some guidance (Avison, 2004a, p .5). Clearly, he thought music's powers so pertinent that the individual needed some direction in how to consume music to his or her own greatest benefit, a thoroughly dietetic idea in itself.

The *Essay* is presented in three main sections, the first "On the Force and Effects of Music," the second "On Musical Composition," and the third "On Musical Expression, as it Relates to the Performer." Through this sequence, Avison argued that "expression" is the particular element of music that allows it to fulfil its primary purpose to stir the passions. To Avison, the passions were a matter of the mind, but they were raised through physical action. He operated within a Lockean model that sets out a chain of stimulations: music effects the ear, which in turn stimulates the mind; the mind senses these passions and creates affections which it turns into ideas. While a mimetic music assumed a direct connection between music and ideas that then resulted in an effect or a feeling by association – as we hear the sound of birds imitated in music, we remember birds first and then recall the emotions we felt while hearing them in nature – Avison criticised a literal imitation of natural sounds in music as this would presume a chain from recognition of or association with passion or affection which stands in opposition to the one he proposes. As such, his view of music departed from a mimetic model in favour of one that was rooted in the mechanics of sound and motion. He assumed that the vibrations of the sounds per se as well as music's motions stimulated the passions and were therefore linked to ideas only in a second step.[2]

In Avison's consideration of sounds per se and of the motion of music, it becomes clear that he does not consider music either poetically or mathematically but that he establishes a third route that links music to the mind and the passions via the medium of human perception. He concludes the first section of Part I (*On the Force and Effects of Music*) with a reference to the specific stimulation that particular timbres of instruments rouse. The sounds of drum and trumpet alone affect the soul, even though they – by association – also stimulate thoughts of fierceness and strength (Avison, 2004a, p. 10). Avison picks up this interest in the material sounds per se in Part III (*On Musical Expression as it Relates to the Performer*). Here, he provides a catalogue of different instruments – the "hautboy, the German flute, the trumpet and French-horn" – with their most appropriate applications within a musical performance based on

the immediate effect (not the associative effect) that these have on the human ear. Man's subjective response to music, then, is at the centre of his investigation; the idea of "expression" in music becomes the shorthand for describing the relationship between sounds, listening and the felt response. He attributes music with a universal validity not on the basis of "rules drawn from the formal Schools of systematical Professors, but from the School of Nature and good Sense."[3] Avison classes human perception as an element of Nature above artistry, the ear and listening above knowledge and learning.

It is on this basis that his indebtedness to dietetics becomes apparent. Shifting the individual's perception centre stage combines with his focus on the passions as the primary target of music and musical activity, as he states repeatedly that "the aim of Music is to affect the Passions in a pleasing Manner" (Avison, 2004a, p. 28). It lies in the nature of musical stimulation, however, that the type of passions raised through these material sounds remain "of the sociable kind" (Avison, 2004a, p. 10), as sounds themselves while perhaps "exciting courage and contempt of death" do not inspire negative emotions such as hatred and cruelty. According to Avison, the "Capacity of receiving Pleasure from … musical Sounds, (was), in Fact, a peculiar and internal Sense" (2004a, p. 5). Music, then, became an ideal tool through which this inner sense could be honed and control over the passions exercised. As a result, Avison appealed to two things that were both borrowed from the theories of the non-naturals: moderation and repetition. Both relied on an empirical approach to music as a sense of stimulation rather than a science or an art.[4]

Avison suggested that continuous repeated engagement with music would best grant music's positive powers over the passions of the mind and keep them in a beneficial state. Through repetition, the inner sense of healthy benign sociability could be honed. Avison's emphasis on sense perception, the passions and the manner in which these can be employed to shape internal senses betrays his roots in Francis Hutcheson's view of man's external and internal senses and borrows from Addison's Lockean view, expressed in his controversial essays on *The Pleasures of the Imagination* of 1712, in which the perceiver was given significance in the assessment and perception of beauty. Hutcheson had promoted the idea of a "moral sense" as an innate human capacity that did, nonetheless, require honing. Its development and training required an active and repeated engagement with the arts, i.e. with that which is beautiful and therefore true and good according to the classical heritage (Hutcheson, 1728; Garrett, 2008). Repetition, moderation and application were all key to the improvement of the inner sense. All three concepts were borrowed from the ideas of physical regimentation in a move that equated the path to moral health with the path to physical health. As such, Avison's controversial ideas about music were rooted in philosophies that had already transferred the idea of regimen from the somatic to the psychic.

The second key element was moderation. Music, according to Avison, keeps "our Attention … from one Passage to another, so as the Ear and the Mind may be equally delighted" (2004a, p. 39, he thus ends Part II). The motion of

music stimulated the faculty of listening via the mechanics of the ear and the faculty of the mind via the passions. Crucially, in his focus on the process of listening, Avison suggested that musical stimulation must be balanced. In fact, Avison in his essay preached moderation and balance that went against rapidly evolving fashions in the concert world. Avison critiqued the new fashion for using the language of the sublime to frame the experience of music. This new type of sublime experience lay in the communal listening experience, granted by the increasingly large-scale performances of G.F. Handel's oratorios across British cities. The terms in which he couched music's powers to rouse the soul mirrored the reviews and descriptions of Handel performances. By 1784, when these performances reached their zenith in the Handel Commemorations in Westminster Abbey with 253 instrumentalists and 257 singers, the correspondent for the *European Magazine* noted that the "immense volume and torrent of sound … was almost too much for the head or the senses to bear," and even Charles Burney in his scepticism of the Handelmania that was sweeping across British lands had to admit to his passions being stirred by "I Know that my Redeemer Liveth" to the point that he – along with everyone else present – was reduced to tears (1785). Handel's music was compared to Dryden's poetry, and Alexander Pope praised its powers to "stir, to rouze, to shake the soul" (1953). That Handel's music was endowed with this power of the sublime was part of a larger national and political project, and while Avison chimed into the glorification of Handel, he was nonetheless critical of the efficacy of musical performances that would overstretch the imagination and unhinge the physical balance (2004b, p. 149). These Handel performances unbalanced the individual instead of educating the passions in accordance with healthy regimen.

Avison separated passions as an innate pre-rational part of the mind from ideas as intellectual faculties, and he advocated that music's stimulation pertains to the former and ought not to attempt to create reactions by stimulating the latter. He came under vicious attack from William Hayes, Heather Professor of Music at Oxford University and associated Organist and Precentor at the University Church. Hayes promoted the science of composition according to strict rules; in his views, music itself could be right or wrong, a notion that Avison thoroughly overturned in his shift onto perception and music's effect on the passions. Hayes published his vitriolic *Remarks on Mr Avison's Essay on Musical Expression* in 1753 in which he pointed out Avison's own seeming deficiencies as a composer by listing all those instances in which his published music broke the strict rules of counterpoint. Avison replied not by retaliation but by explaining the different modes in which he conceived of music, also pointing to the different audiences he sought to reach. He emphasised his desire to focus on the senses alone and to view the effects of music through the individual perceiver when he explained that

> the Plan it was formed upon was of a singular Kind. It had nothing to do with the theoretic Principles, and the mere Mechanism of the Science.

> Its Aim was widely different. Intended, indeed, as a critical, but yet as a liberal, Examen of this pleasing Art.
>
> (Avison, 2004b, p. 133)

Avison practised this in the nature of the discussion presented in his *Essay* as much as in its layout. His concluding sections that measure English church music against secular music, English secular music against Italian music and Italian vocal and instrumental composers against each other serve mainly to offer the reader further exploration of music against which he (or she) himself could measure Avison's ideas. These sections were not a critique but his empirical methodology offered to the reader to trial himself so as to judge music's different effects. For Avison, music's impact on the listener – measured individually through the stimulation of the passions – was the key to music's function. As such, he transferred the idea of regimen to a socio-moral discourse to which the arts had to contribute.

Music between therapy and regimen

In his section "On the Force and Effects of Music," Avison gave music's powers an ancient heritage as a justification for his particular way of framing its effects:

> Music, which influences the Mind by Means of corporeal Organs, was extremely proper. It is a kind of Medium between the bodily Exercises that render Men fierce and hardy, and speculative Sciences that render them unsociable and sour.
>
> (Avison, 2004a, p. 9)

Avison here understood music as a physical stimulation that impacts on man's social health. This somatic conceptualisation of music was questioned by musicians and educationalists on various sides, Hayes among them, yet it was rooted in long-held beliefs in music's therapeutic powers.

Browne's *Medicina Musica: Or a Mechanical Essay on the Effects of Singing, Musick, and Dancing, on Human Bodies* was specifically devoted to the subject of music and health. Browne veered between music as a therapeutic tool and music's role in regimen. Both versions of his argument, though, were indebted to the idea of the six non-naturals. On the one hand, singing, construed in terms of the non-natural exercise and rest, became a regulatory tool, while, on the other hand, music in general affected the sixth non-natural, the passions of the soul. In three chapters devoted to singing, music and dancing, he explored their medical uses with the implication that both singing and hearing music were essentially more beneficial in keeping a healthy lifestyle than in curing disease.

The chapter on singing is the most significant as it sets up a series of propositions on the workings of human body and soul that become the fundament

for all other arguments. Here, Browne proposed his main thesis and provided his supporting evidence before examining how this may be beneficial in the preservation of health generally, and before concluding "in what diseases this may be beneficial and in what prejudicial" (1729, p. 25). He thus ordered the chapter on singing akin to a philosophical tract more than a medical theory. The order of his propositions is significant: he proceeds from the proposition that "there is a Sympathy betwixt the Soul and Animal Spirits" (Browne, 1729, p. 7) to a series of arguments that break down the manner in which the animal spirits affect the body. Proposition II is the suggestion that "the motion of the heart and consequently the circulation of the blood, depend upon an influx of spirits; and the greater the influx is, the stronger in proportion will the pulse be, & è contra." Proposition III discusses digestion as a result of the animal spirits that infuse the muscle fibres in the stomach and the abdomen, with the diaphragm acting as a hydraulic pressure valve. He proceeds to the action of breathing and the relationship between air pressure and the circulation of blood, and the influence of temperature on the circulation of blood, before concluding with a final proposition that firmly establishes the benefits of singing by claiming that "in singing the pressure of air upon the lungs is greater than in common expiration." As such, Browne's model of the body relied on Harvey's circulation of blood that established an interconnection between all parts of the body and combined this with the iatromechanical model of the body in which the animal spirits are responsible for regulating the movement of air and blood around the body, caused by the heart. The animal spirits in his medical edifice were the point at which body and soul interact. The regulation of the animal spirits influenced both body and mind, and each could impact on the other.

In proposing a regulation of the animal spirits, Browne reverted to the six non-naturals:

> five of the non-naturals may produce disorders towards the prevention of which singing cannot very much conduce: I have only endeavour'd to demonstrate how it may forward Digestion, the Circulation of Blood, and Secretion of Spirits, and by that means enable the Body to support itself in the Execution of its various Functions. Nor would I be thought to assert, that it is alone a sufficient Remedy for those Diseases I have so much commended it in; on the contrary, I think it entirely necessary to have recourse to Medicines, proper in such Cases, the good Effects of which, Singing may promote, as it is an Exercise so agreeable and entertaining.
>
> (Browne, 1729, p. 29–30)

Singing, in summary, promoted the secretion of spirits, braced the fibres (to make them more tense) and increased the velocity of the blood's motion (Browne, 1729, p. 25); singing aided digestion (Browne, 1729, p. 28), it affected diseases of the lungs and could be helpful in relieving asthma but, Browne warned, it could also be detrimental in other lung conditions.

Singing was thus seen as a regulatory tool. But, in Browne's view, for nervous disorders

> such as the hypochondriack, hysterick, and melancholick affections *singing* will be much conducive to the cure: for as in these diseases the mind is fill'd with gloomy dejecting ideas, and the body labours under a deficiency of spirits, and as by singing we may possibly strike the ear so pleasingly as to affect the mind, and divert our anxious thoughts, by the succession of the brisk and lively ideas of the tune; we may certainly by this means clear and elevate the soul, and by sympathy invigorate the motion of the spirits. (Browne, 1729, p. 28–29; Semi, 2016)

Here, Browne suggested a different route of effect that goes via the ear to the mind but is independent of the animal spirits or physiologies. The mind in turn, then, affected the physiology. Music generally (not the act of singing alone) thus communicates pleasure, mirth and joy directly to the mind and can thereby aid mental and physical health as it "eases the diseases of the mind" (Browne, 1729, p. 15–16).

When Browne republished the essay in 1729, he appended to it an essay "Of the Spleen and Vapours, or Hypocondriack and Hysterick Affections" (1729, p. 69) as a practical example of music's influence on distempers of the soul. Similar to the attention given to the stomach and digestive system in discussions of the passions, the vapours remained closely tied to the passions in public perception (Kennaway and Andrews, 2019). While Browne acknowledged that "a surprising versity of Symptoms renders the knowledge of this distemper vastly difficult to be attain'd to," he nonetheless suggested that music, and the act of singing in particular, could "contribute to the cure, only as they help to invigorate the spirits" (1729, p. vii). He used music here as a proof for a new theory that the spleen is not "an orgasm, ataxy or tumultuous Hurry of the Spirits, but on the contrary … a defective Secretion." As spleen was commonly seen as an illness that befalls women more readily than men, Browne addressed the treatise to them in particular and used the opportunity to promote the work of their singing, dancing and music masters in a move that would become increasingly characteristic in discussions of regimen as it tied together pastimes and their effects on passions with physical and moral regimen.

His long essay on spleen and vapours revisited his consideration of two of the non-naturals: motion and rest (i.e. exercise) and the passions of the mind (Browne, 1729, p. 120), thereby putting his previous propositions into a practical context. Browne suggested dancing and music as the two means that can aid the cure from this disease of the mind and a means of preserving health, but deemed music to be the more powerful of these:

> But of all Exercises whatever, Dancing to a well-play'd Consort seems to be the most beneficial, for it does not only elevate the depress'd Motions

> of the Solids and Fluids, barely by the Application of Motion; but at the same time is assisted by the mighty Power and Energy of Musick: For as the Harmony of Sounds by means of the Organ of Hearing, communicates a sovereign Pleasure to the Intellectual Principle, and fills the Mind with gay enlivening Ideas, so by Sympathy it transmits its delightful Influences to the Body, adds news Life and Vigour to the whole Machine, and raises Sensation and Motion to their utmost Degree of Perfection.
>
> (Browne, 1729, p. 120)

That Browne here was still steeped in a Galenic tradition in which individual character and disposition were considered a result of the gases and fluids in the body is obvious in his advice that one should "entertain yourself with such diversions, as by being agreeable to our particular Humour, are most adapted to raise and excite in the Mind a pleasing Sensation, and cause a joyful Serenity" (Browne, 1729, p. 122). In other words, the choice of dance and music is determined by a person's disposition and by his level of training his sense perceptions.

Browne, like Avison, wrote in a manner that encouraged his readers to explore his thesis by putting music to the trial of their own senses. He wanted his audience to practise music frequently, to refine their sense perceptions and to train their ears and their minds. In the particulars of his plan, Browne's treatise compared with Avison's is indicative of the perseverance of mechanical models of body and soul, in particular the iatromechanical model; both, however, engaged with the idea of pastimes as tools for moral and medical regimen.

Regimen and cultural practices

The physician and later political rebel John Burton was one of several physicians writing around mid-century who sought to reconceptualise medical practice by opening it up to investigating the relevance and potential health benefits of cultural practices (Gouk, 2014). As engagement in culture, the arts and education was increasing rapidly, these medical thinkers extended the theories of the six non-naturals to think about wider health preservation that comprised the key elements of this theory: physical action, sensual perception and the imagination. Reduced to these three elements, the theory of the non-naturals with its key aspect of balance became a ready model through which to regulate leisure time and educational activities. Cultural practices – the fine arts, literature, scientific writing for the laymen, theatre and music – shifted centre stage.[5]

This required a critical investigation of the traditional divide between theory and practice in medical treatment, something that Burton set out in his preface to *A Treatise on the Non-Naturals* of 1738, for instance (1738). He contrasted those who practised healing based purely in experience yet were devoid of any rational and scientific knowledge of "drugs and diseases" (Burton, 1738, p. 6) with those who are "the greatest masters of reasoning" yet "neglect to consult nature itself." The latter he accused of discussing Aristotle and Galen at length

without ever "searching out the truth of things, of confirming or disproving any doubtful opinions by experiments, and careful observations of facts" (Burton, 1738, p. 9). While these "squared practice by his hypothesis," the rival faction relied on appearances alone without ever measuring these against facts and knowledge (Burton, 1738, p. 9). In other words, they were unable to deduce a cause from the visible, audible or tangible effect, therefore treating only ever the symptoms, and in doing so frequently were "not able to discern between differing similitudes and similar differences" (Burton, 1738, p. 6).

Burton's objective in writing the treatise was twofold: on the one hand, he endeavoured to establish Boerhaave's theories in Britain (having studied with Boerhaave in Leiden), defending them against older models of conceiving of health and disease. In doing so, he advocated a new path in medical practice that bridged theory and practice by equipping the physician to "reason scientifically on the nature of diseases, and the operations of medicines so as to deduce a just method of practice" (Burton, 1738, p. 5). The primary purpose of medicine for him was first and foremost to relieve an individual of a disease that has befallen him. To this end, all different pathways had to be explored and brought together. He lamented that even great advances in anatomy were failing to coax members of the medical community out of the camps from which they viewed their discipline, to the detriment of both those in need of treatment and the wider health of society. The knowledge of the body, the relationship of the body to the cosmos and the alleviation of ailments ought to work together towards the improvement of health. It was equally significant for him to heal as to keep the body in a state of health.

For Burton, the relevance of the arts in the establishment and retention of health lay in the fact that the arts could potentially engage the mind as well as the body. The best exercise, in his regimen, was that which would engage the mind and not leave the body to fulfil mindless physical exercise (Burton, 1738, p. 259). It follows that the most useful art therefore was one that demanded both the physical and the mental, a prerogative that music was uniquely placed to fulfil. While the impact of music on the mind alone, via the ear, can aid proper cure, the impact on the mind of the act of engaging in music was yet more potent. Burton did not discuss the different arts but he nonetheless revealed in an aside that "I rather agree with Baglivi that mathematics, rhetoric, astronomy etc. are as conducive to an exact history and cure of diseases, as the Art of Painting is to music" (1738, p. 11). While he ostensibly critiqued a particular medical faction here, he implied that music ought, of course, not to be assessed in the same manner as a painting but must be assessed on its own terms. In other words, he expressly denied that imitative or associational powers are the primary agent of music's effects on man.

Burton's desire to overcome the divide between practice and theory in the medical field found a parallel in music as an artform that was acknowledged both as a practical pastime and as a theoretical field of study. In the early eighteenth century, following a move onto the idea of music as a means of human, rather than divine communication, these two fields collided perhaps

more prominently than they previously had. Browne and later Avison were writing in a style that sought to break down the divide between theory and practice, between what scholars understood by health (in the case of Browne) and music (in the case of Avison) and what readers perceived with regard to their bodies, their health and their pastimes. Even though for both writers the body remained a machine, both called on empirical evidence as the only way to ascertain how the mechanics of the body actually affect the passions of the mind, expressed in the perceptible and describable feelings of the individual. In their move to bring practice into the theoretical forum of the treatise, both Browne and Avison advocated a balanced manner of *engaging* with music, i.e. an engagement by the individual independent of the music itself and of the professional performer. Browne's essay was, in fact, a rare example of a treatise that treated music primarily (and, in fact, almost exclusively) as a practice. He discussed music as an activity that people often engage in in rather informal ways; his "documentary evidence" here is the example of a singer whose tunes would make other people's ears hurt, yet which the singer himself cannot accept as out-of-tune. Singing in particular was a voluntary and frequent activity and therefore an easily accessible means of preserving health. Browne showed comparatively little concern for the types of music that one engages in, nor their compositional specifics. Music to him was a practice that came naturally to individuals; he did not discuss it as an art.

Avison similarly sought out music's power in practice. Like Browne, he promoted active engagement which could happen through listening or making music. The latter was the more pertinent in light of his audience: the amateur musician who engages in domestic and other sociable music-making of vocal repertoire as much as of trio sonatas and concerti grossi. Indeed, he advertised his own publications with reference to the sociable education promoted through music:

> This kind of music is not, indeed, calculated so much for public Entertainment, as for private Amusement. It is rather like a Conversation among Friends, where the Few are of one Mind and propose their mutual Sentiments, only to give Variety, and enliven their select Company.

He writes of a selection of music for harpsichord that can be extended ad libitum to include two violins and a violoncello (Avison, 2004c, p. 177). Repeated engagement, Avison believed, would aid the moral education of the individual and the moral health of society.

Yet Avison's *Essay* was explicitly about music's expression (and thereby perhaps less obviously than Browne's about the act of making music); the act of making music was framed always with a strong directive for music's role in social, emotional and moral health in mind. His final section – Part III – on the performance of music is unique, as is the inclusion of its second subsection "On the expressive Performances of Music in Parts." Here, he directly addressed the amateur performer mounting performances of the sociable kind. This section

is suffused with the narrative of balance and moderation. He explains, for instance, that the individual parts of a composition must be staffed in relation to each other to achieve the music's effect, and he also stresses that too great a number of overall performers would lead to an excess that is detrimental (a thinly veiled critique of the Handel performances ever growing in size!), a thought that he expressed clearly in the preface to his Op.3 concertos (Avison, 2004c, pp. 161–162). Contrast is key to the effect, yet anything too overtly bombastic would obscure this very contrast; sociability remained at the core and influenced music's efficacies on the mind.

Avison's section on the timbre of instruments is equally suffused with the idea of retaining a healthy balance and contrast, as are all his hints to performers: organists and violinists alike must moderate the swelling of their sounds, their "Encrease and Diminutions" (Avison, 2004c, p. 168); no instrument should exceed its natural dynamic range (Avison, 2004a, p. 43), the organist must choose registrations carefully so as not to overbalance the other instruments or the voices, and no performer must over-ornament the musical lines. In addition, the perfect balance depends on the stylistic context and the performance venues (Avison, 2004a, p. 45–46). In writing of the "Variety of Expression which elevates the Soul to Joy or Courage, melts it into Tenderness or Pity, fixes it in a rational Serenity, or raises it to the Raptures of Devotion," Avison betrays his Hutchesonian heritage (2004a, p. 30). The latter's "uniformity amid variety" ideal, however, had relied on concepts of harmony and order that were mathematically based, while Avison's are articulated through their reception in the human ear and mind. In addition, they translated the idea of balance and moderation to the social sphere.

While the necessity of language and linguistic structure to keep music in check held sway under the imitative aesthetic ideal, performers in particular – like Avison – turned to the physical sensation of performance to explain music's effects and through this the development and recognition of what is good and what is bad. In tandem with this, the idea of moderation was transferred from the somatic to the social and quasi-psychological realms.

Moderation, melody and the idea of sympathy

Browne explained in his section on Musick that the exact manner with which music affects the passions of the mind and "rouzes or calms the Motion of the Spirits" depends on the manner in which the sounds "differently modulated touch the Auditory Nerves" (1729, p. 32). He then added a discussion on the nature of sounds "and their Manner of Conveyance," in which he evoked the anatomical ear to explain the impact of sounds on the auditory nerve (Browne, 1729, p. 35–36). He used the mechanical model to explain the effects of sounds.

> Musick is only a Composition of Sounds, founded upon a Concordance of Tones, and the more exact and true the Proportion of Notes is, the more

> harmonious is the Tune, more grateful to the Ear and more pleasing to the Mind.

In this view, then, music was just the right combination of sounds, but despite this not everyone was "sensible to the charms of music."

While Browne rooted this in the individual's humours, Avison took this back to the music alone. Yet, both writers critiqued particular music that would be appropriate to effect the regulation of moral health. Browne gave as a good example a "well-played Consort" that pleases the Sensations in the Mind, and he also promoted the particular timbre of the fiddle "soft, slow languishingly struck" as a music that will "so finely and delicately touch" the nerves that "the sensation will be so exquisitely pleasing and ravishing as to cause the Spirits to flow back in gentle Undulations" (1729, p. 36). So as to test empirically the flowing of the spirits and the pleasing sensations that this creates, Browne urgd his readers to recall the effects of listening to the

> fine Adagio and Allegro Parts in the Italian Operas, whether by the ravishing Softness and Melody of the first he has not found his Spirits by Excess of Pleasure to flow back in gentle Undulations; and whether by the brisk and lively Vibrations of the last, he has not felt fresh Life and Vigour flow from the persuasive Sound of such a sprightly harmonious Consort.
>
> (1729, p. 38–39)

It is significant here that the contrast inherent in Italian opera creates its particular effect, not each part alone. As such, balance between different types of sensation is key here.

Avison similarly dismissed some music as being wholly ineffective (some types of English air in particular), and he also promoted moderation in the manner in which music was performed. Here, his anti-virtuosic rhetoric comes to the fore when he chides Italian opera stars for striving "rather to surprize, than to please the Hearer" (Avison, 2004a, p. 15), a habit that he described as a "silly Vanity" that gets in the way of music's power. Here, the music is unbalanced by the over-ornamentation of the performer and therefore ceases to be effective.

Avison's anti-virtuosic rhetoric also reveals that he believed in the interaction between the manner of producing the sound and the resulting effects of the music. Good, effective music relies not on "those agile Motions, or Shiftings of the Hand which strike with Surprize the common Ear, but in the tender and delicate Touches, which to such indeed are least perceptible, but to a fine Ear productive of the highest Delight" (Avison, 2004a, p. 51). Here, Avison promoted a careful balance between the composer's ideas as set out in the musical text, the performer's skill and, crucially, his or her taste. The latter was at once the arbiter that determines the manner of performance and the indicator of the performer's level of cultivation and understanding. Crucially, neither part of this triumvirate relied on imitation, or on music's relationship

to words, but all three were tied to key components considered to be of the body: sense perception and the mind.

Both writers, then, considered music's effects ultimately to rely on the close relationship between body and soul. And for both, performance and engagement were crucial to the unfolding of music's powers and its ability to aid physical, mental or moral health. As such, neither placed a hierarchy upon instrumental and vocal music as Sulzer would later do so as to control the obvious physical effects of music through rational discourse. Avison in particular avoided the hierarchy – to his amateur musicians in Newcastle, he promoted instrumental music in the form of concerti grossi (composed by him so, granted, he stood to benefit financially). The fact that this music was equally valid relied on his model of understanding music's powers to rely on the stimulation of the mind as part of the pre-rational body.

Both writers also combined recent interest in the senses and their relationship to the emotions or passions – as it had emerged from the medical discourses on the six non-naturals and their balancing of body and soul – with theories of sympathy (and, by extension, empathy). The idea of sympathy had roots in physiology and medical thought but was also developed as a philosophical concept. Scottish enlightened thinkers frequently used the term to describe both physical processes and psychological phenomena (Barfoot, 1990; McCullough, 1998). The physiological idea of sympathy extended theories of sympathetic motions between body parts (damage in one part causing pain elsewhere) to the notion that the body's fibres would be put in motion by the vibrations of sounds. These theories were explored widely, and in the French discourse on *opéra comique*, for instance, were developed in the wake of Condillac's theories of the "sixth sense of sympathy." Mostly, these theories betrayed simply the increasing interest in the body's sensate characteristics (Le Guin, 2005). In Britain, the idea of sympathy had been developed by Francis Hutcheson. He thought of sympathy as a central philosophical concept divorced from its physical instantiation, a concept that merely described the analogous operations or harmony between the true, the beautiful and the moral within human conception, while under the influence of Hartley's nerve theories around mid-century, the idea of sympathy would regain a physical component through the vibration in the air and in the human body (Alberti, 2006; Kennaway, 2012; Semi, 2016). The concept was elaborated further by David Hume and Adam Smith, both having developed in their own way a general theory of sympathetic relationships between individuals. For both, sympathy was a principle of communication based on feelings, not on reason. While they formulated the process of sympathetic communication differently – Hume via understanding and Smith via a reproduction of the feeling – the stimulant in both philosophies were based on the passions, and as such involved inner motions. The capacity for sympathetic communication, then, was an innate sense in need of training.

Both Avison and Browne used the term sympathy; for Browne this still described mechanical processes, while for Avison the idea of sympathy remained an indistinct connection between the engagement with music and

the motions of the mind. He did not distinguish between the passions and the mind, viewing their impact as one and the same. The idea of sympathy, based in movement and motions, guaranteed the equality of vocal and instrumental music as both were capable of influencing man in the same manner. Music was deemed powerful not because of any concept of imitation, nor because of its harmonic science but because of the impact a melody could have on the imagination as part of the mind.

In Browne's treatise, music is equivalent to melody: he discussed the single act of singing in one voice. Melodic lines were similarly the subject of Avison's attention, and indeed, the *Essay* is suffused with details on or references to melody.[6] Browne ranked the Italian composers according to their ability to invent "powerful and commanding" melodies (Browne, 1729, p. 17); and he chided the "learned contrapuntist" for addressing reason and "amusing understanding" but failing to "touch the heart, or delight the ear" (Browne, 1729, p. 19). The "magic spell, which so powerfully enchanted every hearer" in the music of the ancients, he suggested, lies in the "simplicity of melody" (Browne, 1729, p. 20). Similarly, a poor melody renders music wholly ineffective (Browne, 1729, p. 33).

Despite his anti-virtuosic rhetoric, Avison did not, as might be expected, defend English music over the Italian. In fact, he reproached some English secular music as an annoyance, an "incessant jingle in the Ear," and some English sacred music as too artificial on the grounds of its attention to harmony over melody. While writers defending the "ancient" music still adhered to a neo-platonic idea of a correspondence between harmony and a cosmic order, Avison promoted a music that speaks through its melody instead. This melody, however, was not reliant on linguistic structure, but in its movement and construction it created sympathy.

> *Melody* thus distinguished as the Foundation of a musical Composition, and compared to *Design* in Painting, hath been thought by some a vague and indeterminate Analogy; because *Harmony*, rather than *Melody*, ought to be esteemed the highest Excellence of every musical Work: Yet, though this be admitted, it may still justly be said, that *Melody* is, in Reality, the *Ground-Work*, as it is the *first Principle* which engages the Composer's Attention.
>
> (Avison, 2004a, p. 11)

Melody, for Avison, as for Browne, was the element that allows music to impact the mind and thereby influence man's state of feeling and well-being. It is "in a higher Degree, productive of both Solemnity and Chearfulness, than *Harmony*," Avison explained, as it avoids the artfulness that appeals to reason, perhaps, but not to man's innate senses of sociability and morality which are stirred through the sympathetic process that exists between the motions of melody and the motions of the mind (2004a, p. 35).

Ultimately, both essays, Browne's and Avison's, functioned as advice manuals that were concerned with the regulation of the passions. Their vocabulary

and their ideas resembled each other, and both were influenced by the medical ideas of regimen reflected in the fact that moderation and balance were central to their advice. In the manner of engaging with music, balance and moderation were key, while in the music itself, the melody as a simple string of continuous motion was the most significant element that most closely resembled the motions of the passions and the mind. What distinguished the two writers was the transfiguration of the key concepts of dietetics and regimen in the attention to the sixth non-natural – the passions of the mind in particular – from medical to psychological categories. By the time Avison was writing his treatise, the idea of the regulation of the non-naturals had been extended to an extra-physical category. Avison promoted this idea of a moral health beyond his *Essay*. In an advertisement published in the *Newcastle Journal* in 1758, he explained that music "keeps alive, and improves the social and benevolent Affections," a process he saw enhanced by the fact that music was usually experienced in the "general Intercourse of Friends and Acquaintances" (Dubois, 2004, p. xii). Here, music's effect to "harmonise the passions of men," its social interaction and its empirical nature are significant (Avison, 1768, p. 1.278). In the new discourse on the innate sense of morality and sensibility, established via man's capacity for sympathy, moderation and balance remained central – a notion that would ultimately be adopted into the theories on moral health and thus cast its long shadow across the nineteenth century.

As passions are gradually divorced from the physiological condition of man, what remains are two aspects: the overriding idea that the passions and later the emotions need to be controlled, and the idea that this control is achieved through a dietetic approach that can harness particular emotions while suppressing others. In other words, the concept of regimen is employed as a means to control man – sold to him/her first as the establishment of physical and later of moral and social health – far beyond a belief in passions as material processes. This chapter has highlighted the influences that medical thinking had on cultural practices. What's interesting here is that the medical and aesthetic discourses align very neatly during the mid-eighteenth century. They part ways in the early nineteenth century as music aesthetics increasingly demand sublime experiences, i.e. that which over-stretches the imagination so as to impart a metaphysical construct of truth; in medical terms this music becomes potentially dangerous as it over-stimulates the mind. While the idea of regimen, then, remains potent, aesthetics depart from it and pose the purpose of art in opposition. Only the retrospective view onto the alliance of music and medical theories of regimen in the eighteenth century leads to a full understanding of both the physical roots of the pathological framing of music in the nineteenth century and the later nineteenth-century investigations into music as a sonic rather than compositional, structural phenomenon. Similarly, a history of eighteenth-century music that ignores the purpose of art as rooted firmly in medical thinking transferred to theories of moral hygiene will always lack a full appreciation of those musical parameters that mark much of eighteenth-century musical repertoire: repetition and balance.

Notes

1 Sulzer himself died in 1779, but the project he had begun in compiling the *Allgemeine Theorie der schönen Künste*, initially conceived and published as a one-volume philosophical and practical encyclopaedia, was later revised and published in four volumes in 1792–1794.
2 Avison would come under attack precisely because of this move. See the criticism levelled at him by William Hayes who argued for mimesis in line with other writings on the arts around mid-century, in Charles Avison, *Essay*, Introduction, p. xxiv.
3 Avison explains this in his *Reply to the Author of Remarks on the Essay on Musical Expression* of 1753; the text is a response to William Hayes' attack on Avison's conceptualisation of music as a physical stimulation that could be beneficial prior to or entirely devoid of any mimetic associations. More on this controversy will appear below (Avison, 2004b, p. 133).
4 Avison chose the form of his essay itself to exemplify this and to allow the reader to experience his thoughts as he travels along the text. In this sense, the book is non-didactic.
5 It is on the basis of the increasing centrality of the arts throughout the eighteenth century that Thomas Broman argues that the amalgamation of the theory–practice divide into one, unified system was not so much new after the French Revolution as has traditionally been argued but was a continuation of previous practice in which the practitioners adapted to a new environment (1996, pp. 10–12).
6 Avison appears to give prominence to harmony when he suggests that a piece of music should be studied from a score. He goes so far as to have his music printed and published in score, available for purchase. What it allows the performer to do, however, is to dissolve the music into its single lines, to appreciate each one and to study how they run in parallel to form the harmony that is audible.

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13 The dietetics of the soul in Britain in the long eighteenth century

James Kennaway

The passions of the soul, what we would today call emotions, were by no means an afterthought among the six non-naturals.[1] Since Antiquity, emotions such as melancholy, lust, love, despair and terror had been discussed as a source of physical disease in a way we might now term psychosomatic. Likewise, the existence of somatopsychic conditions, in which imbalances, obstructions or malign fermentations in the body could lead to psychological symptoms, was also widely taken for granted, and some passions could be seen in themselves as "diseases of the soul" (Galen, 1963, p. 53). In the long eighteenth century, the regulation of the emotions for health continued to form a significant aspect of medicine. Although the dietetics of the passions for healthy people have not received as much attention as ideas about feelings and mental illness, there was a substantial literature addressed to laypeople as well as guidance for physicians on advice about how to maintain salubrious order in one's feelings and mental state on a day-to-day basis that both echoed traditional ideas on the subject and also prefigured today's self-help books. Many took the perils of excessive emotion to health very seriously. In the 1760s, the bestselling Scottish physician William Buchan was expressing a wide consensus when he wrote that passion "ruffles the mind, distorts the countenance, hurries on the circulation of the blood, and disorders the whole vital and animal functions," often leading to "fevers, and other acute diseases" and even "sudden death" (1774, p. 82).[2]

One of the most notable points to emerge from an examination of the period's medical advice on the passions is the remarkable degree of continuity to older traditions. Although some have tried to argue for a post-Cartesian rejection of psychosomatic causation of disease, it is clear that the idea that passions affect health and vice versa never really went away. While anatomy and physiology, as well as the epistemological and theoretical basis of medicine, had in some ways changed radically since the Renaissance, the basic guidance on regimen often remained recognisable from approaches going back to Hippocrates. That potent Greek principle of avoiding excess remained the pillar of lifestyle medicine when it came to the emotions as much as with other aspects of health. Although the terminology of the six non-naturals gradually faded over the eighteenth century, it often continued to provide the basic framework for understanding the impact of the emotions. The Anglo-Prussian

writer on regimen Anthony Florian Willich, for instance, was still following that fundamental model in his *Lectures on Diet and Regimen* (1799), acknowledging that while the six non-naturals did not "comprise, strictly speaking, every thing that relates to the different functions of the human body," they did "contain all such conditions of life, as are absolutely necessary, and the greatest part of those circumstances, which are connected with the health and well-being of the individual" (1809, p. 101).

Although continuity is the most obvious aspect of the advice given about the importance of maintaining emotional balance, the theories put forward about the mechanisms, so to speak, that linked passions and the body, of *how* they affected each other, present a more complicated picture. On the one hand, while dietetics was not a field given to clear paradigm shifts, the new epistemological and physiological thinking of this period had a profound impact on understandings of the body. In particular, the focus on stimulated nerves and brain had a huge influence on medicine and culture, as a large historiographical literature since George Rousseau's work in the 1960s has demonstrated (Rousseau, 2004; Vila, 1998; Porter, 1990). Discussions of the passions and health were inevitably drawn into this nerve model of the mind–body connection. On the other hand, crucially, it is also true that older ideas relating the passions to the digestive system and various forms of vapours and fluids continued to be central to debates on the topic. One should not overstate the extent that medicine was revolutionised by the Enlightenment nerve model, which was often incorporated into inherited physiological models of the body, mind and emotions (Andrews and Kennaway, 2017; Vila, 1997). Until the focus on local pathology that developed in the nineteenth century, understandings of disease remained essentially holistic, not restricted to one organ or system, even one as diffused and influential as the nerves.

In our own time, scientific and medical thinking on the nature of emotions and their relationship to the body and to health have continued to undergo important changes (Solomon, 1993; Nussbaum, 2001). Scientists such as Antonio Damasio have highlighted the role of emotions in human cognition, and philosophical observers such as Martha Nussbaum and Robert Solomon have argued that philosophers have been too hostile to emotions, mistakenly depicting them as physical and the opposite of reason. In this context, looking back at the long eighteenth century is illuminating in a number of ways. So many of the serious public health challenges in the West, from obesity to smoking, are not readily amenable to the kind of intervention based on the anatomo-clinical medicine that developed over the nineteenth century. Instead, in some ways we find ourselves in situation similar to the eighteenth century, especially in relation to lifestyle medicine. After the twentieth-century triumphs of hospital medicine, today's focus on broader conceptions of well-being and on mental health are in a sense a return to Enlightenment views of the mind and body.

This chapter thus considers what British observers thought about the medical regimen of the passions and what kinds of theories were put forward to

explain the connection between the emotions and the body. It will look at the statements on dietetics of the leading physicians of the period and at the work of writers on regimen, men who were typically not from the peak of their profession, generally speaking, but middle-ranking journeymen practitioners drawing on the mainstream views of their time. Advice on how to maintain emotional balance for the sake of health was not limited to medical texts but was spread through culture more broadly, intimately connected to the social, cultural and intellectual transformations of the period. As an article in *The Medical and Physical Journal* put it in 1801, "The influence which the passions of the mind have on the different functions of the system, has long formed a subject of curious investigation by the Metaphysician and Pathologist" (Anon., 1801, p. 510). The following section shows the fundamental continuity of dietetic advice on the passions in terms of moderation, but also reflects on the move towards a medicine of nervous stimulation and the medical critique of modern life that emerged from it. After that, the chapter considers the British debate on the mechanisms linking the passions and the body, stressing the persistence of theories focusing on the digestion and the fluids even within the nerve model.

Advice on the regimen of the passions

While the diagnostic and theoretical world of Enlightenment medicine would seem quite alien to a twenty-first-century patient, the broad strokes of eighteenth-century advice on regimen would seem fairly familiar. In particular, the ancient Greek motto of moderation in all things ("pan metron ariston") continued to provide the key note for the regimen of the passions, as much as for diet and exercise. Doctors of the period would generally have had few problems with Galen's statement that "excessive vehemence in loving or hating anything is also a passion; I think the saying 'moderation is best' is correct, since no immoderate action is good" (Riese, 1963, p. 32). Advocates of a medical rationale for maintaining emotional balance may have changed some of its basis in physiological theory, but the justification for a model of behaviour focused on calmness and moderation was a perfect fit for eighteenth-century ideas of politeness and rationality as it had been for Greek and Humanist conceptions of health and virtue. In this approach, ancient philosophical and religious ideas were in many ways as influential as ancient medical ones. At the same time, however, newer conceptions of the body and mind in terms of the nervous system and changing attitudes towards the delicate sensibility associated with polite society were also having an impact.

An obvious ancient source for eighteenth-century ideas of moderation in the regimen of the passions was Stoicism. That school's teachings of the necessity of controlling one's feelings, derived from philosophers such as Zeno and Seneca, and reflected in the Roman poet Juvenal's line "mens sana in corpore sana" (a healthy mind in a healthy body), had experienced a major revival since the Renaissance and offered observers a philosophical background for

their ideals of rational restraint.[3] Many of the period's writers on dietetics put the demands of health for emotional self-discipline into recognisably Stoical terms, as a necessary victory of reason over chaos. Thus, while historians have stressed the role of the medicine of the nerves in the creation of the whole culture of sensibility, it is equally the case that medicine provided a basis for the Enlightenment's cult of reason – being rational was good for the health. James Mackenzie's *The History of Health, and the Art of Preserving It* (1763) was typical in suggesting that "He who seriously resolves to preserve his health, must previously learn to conquer his passions, and keep them in absolute subjection to reason" (1763, p. 388). Likewise, William Buchan's *Domestic Medicine* (first edition 1769), which contained a good deal of dietetic advice, gave this medical-Stoical warning of the perils of not overcoming the passions. He wrote that,

> No person can prevent misfortunes in life; but it shews true greatness of mind to bear them with serenity. Many persons make a merit of indulging grief, and, when misfortunes happen, they obstinately refuse all consolation, till the mind, overwhelmed with melancholy, sinks under the load. Such conduct is not only destructive to health, but inconsistent with reason, religion, and common sense.
>
> (Buchan, 1774, p. 86)

Given the long-standing assimilation of Stoicism into Christian thinking, Buchan's allusion to the link between emotional moderation, reason and religion was also conventional. Indeed, another point of strong continuity with previous thinking on the passions and health is that God had a more prominent place in eighteenth-century dietetics than a simple narrative of secularisation might suggest. Since the whole subject of the role of the passions in health mixes issues related to the body and the "care of the soul," it is perhaps not surprising that religious and medical language was often combined. The Church Fathers and scripture provided arguments for the subjection of the passions by reason as much as Stoicism, especially in relation to sexuality. For instance, the leading Scottish doctor George Cheyne, author of *The English Malady* (1733), was led by his passionate Episcopalianism, drawn from his roots in the North East of Scotland, to emphasise the relationship between God, health and the regimen of the passions in his work (Guerrini, 2000, p. 125). Perhaps the most famous example of overtly Christian medical advice literature in this period is John Wesley's *Primitive Physick* (1747) (Figure 13.1). His fundamental advice connecting the emotions and health was that the

> Love of GOD, as it is the sovereign Remedy of all Miseries, so in particular it effectually prevents all the due Bounds. And by the unspeakable Joy and perfect Calm, Serenity and Tranquility it gives the Mind, it becomes the most powerful of all the Means of Health and long Life.
>
> (Wesley, 1765, pp. xxii–xxiii)

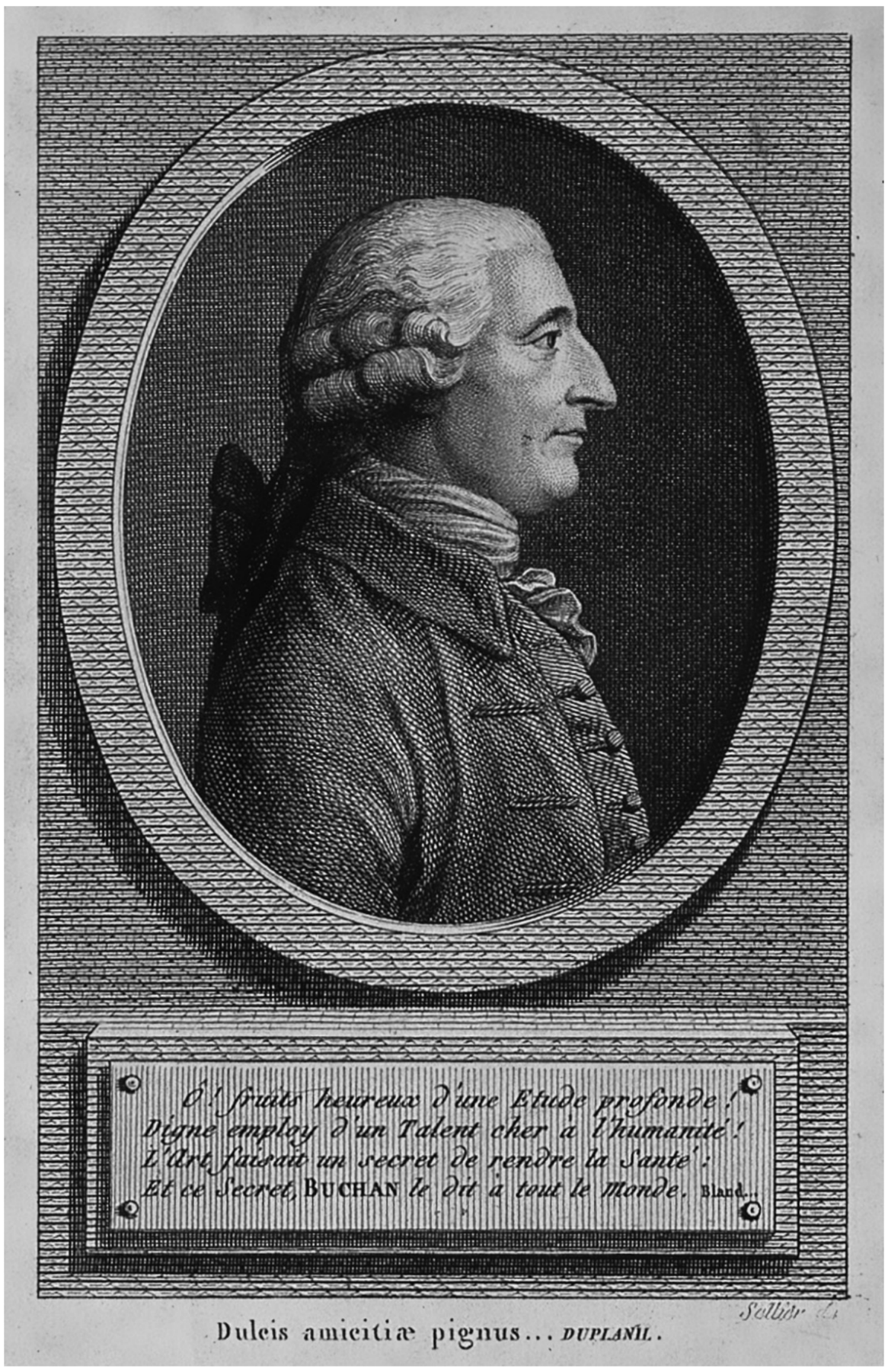


Figure 13.1 Sofia Sellier – William Buchan.

Many writers on dietetics went beyond admonitions of piety and moderation and gave examples of conduct and attitudes that could serve to fight off melancholy and other dangerous passions, most of which reflected ideas that were hundreds if not thousands of years old. Some suggestions were relatively simple, like the advice of Francis Bacon, quoted by many subsequent physicians, that, "Chearfulness of spirits are particularly useful when we sit down to our meals, or compose ourselves to sleep; because anxiety or grief are known to prevent the benefits, which we ought naturally to receive from these refreshments" (Mackenzie, 1763, p. 391; Fothergill, 1767, p. 44). William Buchan gave a fuller sense of how passions could be kept in check, arguing that avoiding becoming fixated on anything was key:

> Turn the attention frequently to new objects. Examine them for some time. When the mind begins to recoil, shift the scene. By this means a constant succession of new ideas may be kept up, till the disagreeable ones

> entirely disappear. Indolence nourishes grief. When the mind has nothing else to think of but calamities, no wonder that it dwells there.

One should throw oneself into work avoid low spirits, since "Few people who pursue business with attention are hurt by grief." Likewise, "Innocent amusements are by no means to be neglected" as they "help to dispel the gloom which misfortunes cast over it" (Buchan, 1774, pp. 86–87).

While the themes of morality and balance continued to be a potent presence in Enlightenment dietetics, as the eighteenth century wore on, the medicine of the nerves and the associated culture of sensibility affected thinking on the regulation of the passions – even if, as we shall see, the time-honoured focus on the digestion persisted. This shift can be seen in many different contexts. For instance, the impact of music, one of Buchan's innocent amusements, which had a long history of use in the moderation of the passions, was increasingly conceived of in terms of the nerve model (Kummel, 1977; Horden, 2000). For many centuries, the essential model in understandings of music was Pythagorean and Neo-Platonic, with music having the goal of aligning the emotions with cosmic harmony. However, the seventeenth century saw a shift to understanding music in terms of acoustics and nervous stimulation (Gouk and Sykes, 2011). Eighteenth-century Britain saw a number of books that argued for the use of music therapy, notably Richard Browne in his 1729 *Medicina Musica* and Richard Brocklesby's 1749 *Reflections of Antient and Modern Musick*, many of which also argued that music could be part of the regimen of the passions for healthy people (Browne, 1729; Brocklesby, 1749). Browne suggested that singing was particularly beneficial: "no other exercise whatever can more contribute to the preservation of our health" (1729, pp. 7, 25). The dietetic books of the period often mention music. For instance, Buchan argued that it could counteract melancholy and the effects of excessive study (1774, pp. 136, 325). By the end of the century, however, new ideas about the nerves and anxieties about hyper-refined urban lifestyles led to a more negative view of music, with increasing concerns that musical excitement might over-stimulate the feelings, either directly or via the nerves, and lead to serious mental and physical illness (Kennaway, 2012). For instance, while Willich expressed faith in the power of music to alleviate "grief, and other depressing passions," but, following the principle of moderation, he also warned that it "may in the end increase the disposition to nervous weakness, by its too frequent repetition" (1809, p. 289).

The impact of reading books on the emotions and health was also the subject of medical debate in the period that followed a similar pattern of moving towards a less positive stimulation model (Kennaway and O'Connell, 2016). Generally, reading, again at least in moderation, was seen as a benign distraction from dangerous passions. Buchan, for example, wrote that

> the study of any art or science, reading or writing on such subjects as deeply engage the attention, will sooner expel grief than the most sprightly

> amusements. It has already been observed, that the body cannot be healthy unless it be exercised; neither can the mind.
>
> (1774, p. 87)

On the other hand, some commentators also expressed anxiety that excessive serious study could actually lead to unhealthy emotions and disease, an idea that had spread since Marsilio Ficino's work in the fifteenth century (1529). A newer development in this context was the idea that frivolous books (especially French novels) could over-excite the feelings via the nerves in a different, more sensual way, but also with pathological consequences (Kennaway, 2016). Willich expressed a commonly held belief among dietetic writers when he argued that romantic passions could become pathological in "young females" if they made a habit of "reading improper novels" (1809, p. 363).

These medical anxieties about romantic books were part of an extensive eighteenth-century medical discussion of love as a dangerous passion, especially for young women. While the last few decades have produced a rich historiography on sexuality, medical attitudes towards romantic attachment and its pathological excesses have been comparatively neglected, even though the topic retained a remarkable prominence. The idea that lovesickness, conceived of as overwhelming unrequited love, could be a medical issue was taken seriously from Antiquity and was much discussed in the Middle Ages and Renaissance (Duffin, 2005; Altbauer-Rudnik, 2012). Ovid's poem *Remedia Amoris* (The Cure for Love), the companion piece to his *Ars Amatoria* (The Art of Love), ends with a section entitled "The Doctor's Last Advice." Writers in the early modern period also showed interest in the subject, reflected in books such as Jacques Ferrand's *Erotomania* (1623) and *De malo aphrodiseo* (1697) by the Leiden physician Jacob Rau.

Eighteenth-century medical attitudes towards love and romance generally followed the theme of moderation in all things, in line with the general continuity in dietetics. Within the bounds of rationality, love was depicted as a boon for health and indeed as a cure for diseases. Willich, for instance, suggested that it

> enlivens the pulsations of the heart and arteries, promotes the operations of the different functions of the body; and it has frequently been observed, that a strong attachment to a beloved object has cured inveterate disorders, which had resisted all medicinal powers, and which had been considered incurable.
>
> (1809, p. 359)

Excessive romantic feelings, however, were a clear threat to self-discipline, not to mention Enlightenment politeness and social order. As Buchan put it, "Love is perhaps the strongest of all the passions; at least, when it becomes violent, it is less subject to the controul [sic] either of the understanding or will, than any of the rest" (1774, p. 87). As such, immoderate romantic feelings were generally

condemned in the strongest terms by dietetic writers. Similarly, Willich was clear that an

> extravagant degree of love, or such as transgresses the bounds of reason … is … no longer a pleasure, but a disquietude of mind, attended with the most irregular emotions; it disorders the understanding; gradually consumes all the vital powers, by a slow fever; prevents nutrition and reduces the body to a skeleton.

It could also lead to "a deprivation of the understanding" or "imbicility." While much of this advice followed traditional principles of emotional moderation, medical thinking of romantic love was also increasingly influenced by the medicine of stimulation and of anxieties about modernity and its supposed mores. Willich was also typical in advocating marriage (that is to say, a forum for a legitimate expression of sexuality) as a vital means of maintaining balance of such passions (1809, p. 363).

Medical attitudes towards reading in the period were also influenced by debate on the dangers of disproportionate enthusiasm. The seventeenth century had seen a considerable assault on enthusiasts as victims of a form of pathological religious fanaticism, as Michael Heyd has shown (1995). Like the Stoics before them, early modern critics of enthusiasm portrayed it as a threat to the state, religion and individual health. In the 1680s, the English writer Henry Wharton was representative in blaming Catholic mysticism on "disturbed imagination" linked to "undigested vapours" (Wharton, 1688, p. 11; Heyd, 1995, p. 197). Cast in the form of Baconian and later Lockean sobriety, this hostility towards the idea of loss of self in ecstatic feeling was to have a profound effect of Enlightenment thinking, as Bernd Bösel has shown in his excellent *Philosophie und Enthusiasmus* (Bösel, 2008; Goldstein, 1997, pp. 29–49). John Locke himself, in his *Essay Concerning Human Understanding* (1689), expressly attempted to build a new epistemology on the dichotomy between "the visions of an enthusiast, and the reasonings of a sober man," and suggested that enthusiasm had medical roots, arising "from the conceits of a warmed or over-weening brain" (1825, pp. 431, 594). By the end of the eighteenth century, such thinking was generally expressed in the context of over-stimulation, with a broad assault on "enthusiastic" aspects of culture, sects such as Wesley's Methodism, and politics, especially in the 1790s in the wake of the French Revolution.

The role of restraining the passions in discussions of individual and civic vice and virtue gave the medical debate on the regimen of feelings an inevitable moral and political edge, shifting in focus over time. As Jonathan Barry has noted, the "medical populists" of the early part of the century were often Tories with an open agenda to "preach temperance and morality against luxury and corruption" in the interests of social stability and the preservation of hierarchy (1985, p. 170). Later there was a strong element of the politics of "healthy" republican virtue in advice for healthy living, advocating self-control over the emotions as part of a crusade against luxury and vice, making dietetics a vehicle

for Enlightenment social reform, bourgeois restraint and abstinence. In the final decades of the century, the influence of Jean-Jacques Rousseau's critique of sensibility and polite society as artificial, immoral and unhealthy was also felt, as appeals to nature were given a new spin. Physicians were increasingly hostile to contemporary social mores and lifestyles. James Makittrick Adair's *Essay on Diet and Regimen* (1804), for instance, made it clear that in his view the dangers of the passions for the body were to a great extent the product of modern urban society and its bad habits:

> Strong firm health is the lot of but a small part of the members of civilised societies; and this obviously proceeds from our erroneous education, by which the senses, appetites, and passions, gain a dangerous predominance over the reason and conscience; because we fear self-denial earlier than we know guilt; and are delighted with the pleasures of self-gratification before we are conscious of the excellence of virtue. By these injudicious gratifications, health is often utterly lost, to a degree that no wealth can re-purchase, or skill and assiduity restore.
>
> (Adair, 1812, p. v)

Humanist moralism on the perils of luxury had long had a medical angle, but with the French Revolution and the rapid development of mass urban society, there was a severe crisis in that view of the relationship between health and modern life and a markedly sharper medical hostility to the "excessive" feelings associated with sensibility (Sarafianos, 2005, 2008). Influential physicians such as James Johnson, Thomas Beddoes, John Reid and Thomas Trotter turned a paradoxical and ambivalent debate on sensibility and the maladies of the elite into a very modern discussion of the dangers of emerging capitalist modernity to the morals and health of the masses (Trotter, 1808, p. xiii; Johnson, 1827 pp. 1–2; Porter, 2001). In so doing, they set out, decades before George Beard, the essentials of the neurasthenia diagnosis, the classic disease of modernity. The medical critique of modern morals, lifestyles and culture in Britain in the decades around 1800 thus helped provide a modern secular basis for the so-called "Victorian values" relating to emotional restraint, sexual discipline and cultural decency that was as important as the Evangelical Revival or Utilitarianism.

The mind–body connection and the regimen of the passions

Although physicians were sometimes wary of acknowledging too much power for the passions or the imagination on the body for fear of opening the door to witchcraft and quackery, in practice few doubts were expressed in the dietetic works of the eighteenth century about the potent reciprocal influence of emotions and body. There was a clear widespread assumption that causation of sickness and health could travel in either direction, from passions to body as well as from body to passions – as the Scottish surgeon and novelist Tobias Smollett has his character Matthew Bramble note in his 1771 novel *The Expedition of*

Humphry Clinker, "I find my spirits and my health affect each other reciprocally" (1904, p. 159). Some physicians were happy to admit, however, that the exact way that the emotions and the body interacted remained essentially unknown. While Buchan was clear that "The passions have great influence both in the cause and cure of diseases," he went on to acknowledge that

> How mind acts upon matter, will, in all probability, ever remain a secret, it is sufficient for us to know, that there is established a reciprocal influence betwixt the mental and corporeal parts, and that whatever disorders the one, likewise affects the other.
>
> (1774, p. 82)

His fellow Scot John Armstrong expressed a similar view in his eccentric 1744 didactic poem *The Art of Preserving Health*, appealing to the muses to help him elucidate the obscure connection between mind and body:

> Ye poetic shades,
> That know the secrets of the world unseen
> Assist my song! For, in a doubtful theme
> Engag'd I wander through mysterious ways.
>
> (Armstrong, 1744, pp. 103–104)

Nevertheless, discussions of how the passions could affect and be affected by the body had to presuppose at least an implicit model of the connection between the subjective world of experience, feeling and thought and the material world of the flesh (Porter, 2003).[4] Robert Lovell's 1661 *Sive Panzoologicomineralogia* set out a conception of the relationship between the emotions and the body in terms of animal spirits, concoction and heat that reflected inherited understandings that still dominated at that time, the starting point for thinking on the topic during the early Enlightenment:

> The Passions of the mind are no lesse to be regarded; they if moderate, preserving health; and decaying it, if immoderate, and therefore they are to be bridled; and as for the effetis. Immoderate love doth accend, and often causeth palpitation, madnesse, or fainting, joy, if moderate, it recreats the heart and vital spirits; if suddain and excessive it so dissipats the spirits, that often it causeth death. Sadnesse doth by degrees dissolve the spirits, cool and dry the body, hurt concoction, and cause watching, and melancholick diseases, palenesse, and smalleness of pulse.
>
> (Lovell, 1661, p. 74)

Over the long eighteenth century, this model would undergo a complicated transformation, as older concepts such as temperament, humours and heat either declined in importance or were recast in different models. Thereafter, Enlightenment dietetic writers were faced with a set of different theories that

attempted to explain the interaction between the passions, the body and health, reflecting a mixture of Neo-Hippocratic, Galenic, Cartesian, Vitalist, iatromechanical and nerve-based models.

A key figure in changing conceptions of the emotions and the body in the seventeenth century was René Descartes, who described the passions of the body in terms of "a certain very thin air or wind called animal spirits" (Palisca, 2000, p. 306). Casual observers have often claimed that his work led to a strict dualism in conceptions of the mind–body relationship that undermined any sense of psychosomatic/somatopsychic medicine (Damasio, 1994; Rather, 1965; Fischer-Homberger, 1979; McMahon, 1976; McMahon and Hastrup, 1980; Brown, 1985). However, such a view cannot be supported even in the case of Descartes himself, as an examination of his work and the important scholarship on the topic demonstrate. Few today would argue that he ushered in an "era of exclusively mechanistic physiopathology" (McMahon and Hastrup, 1980, p. 207). Steven Shapin, for instance, has set out the ways that Descartes' views on the regimen of the passions included very traditional advice, with a frank admission that the emotions could have a profound effect on health, despite the novelty of the epistemological and physiological basis of his ideas. As Shapin notes, "Everyone who consulted him got the advice to cheer up" (2010, p. 364). Descartes may have attempted to provide a new model of how the passions related to the body, but his implicit acceptance of psychosomatic and somatopsychic medicine blurred any supposed mind–body dualism and he offered advice that would generally have seemed familiar to Galen.

His correspondence with Elisabeth of Bohemia in the 1640s is full of examples of the reciprocal influence of mind, passions and body. In a letter from 8 July 1644, he recommended the "remedies of the soul" as even more important than diet and exercise for the overcoming of her stomach complaint, since they have,

> great power over the body, as is shown by the big changes that anger, fear, and the other passions arouse in it. But when the soul conducts the animal spirits to the places where they can help or harm, it does this not by directly willing the spirits to go in those ways but by willing or thinking of something else. For our body is so constructed that certain movements in it follow naturally upon certain thoughts: as we see that blushes follows from shame, tears from compassion, and laughter from joy.
>
> (Descartes, 2015, p. 20)

The power of the mind over health was such, he continued, that he had seen people sicken and die simply because of the effect of a prophecy of their death by an astrologer (Figure 13.2).

Much ink has been spilt on the impact of new understandings of the brain and nervous system on the post-Cartesian European intellectual atmosphere (Gaukroger, 2002). For George Rousseau, the work of Thomas Willis in particular marked a key shift, helping an empirical British tradition overcome



Figure 13.2 The artist and theorist Charles le Brun's systematic depictions of the passions (Montagu, 1994).

Cartesian Dualism, laying the foundations for the culture of sensibility and Romanticism (Rousseau, 1969). The work of eighteenth-century physicians such as Jerome Gaub (Hieronymus Gaubius) and Albrecht von Haller's writings on irritability and sensibility and their implications for the debate on the relationship between the mind, the passions and the brain seemed to provide further arguments for the nerve model. At the same time, different models of nerve function were asserted and sometimes combined, involving animal spirits, nervous fluid, elastic nerves and speculation about the role of electricity (Rothschuh, 1960; Carlson and Simpson, 1969; Clarke, 1968). However, as we shall see, the argument that conceptions of selfhood shifted entirely to the nerves and the brain in the Enlightenment has perhaps been overstated. The medicine of the nerves did have an enormous influence on medicine and beyond, but until the focus on local pathology in the so-called Paris Medicine in the nineteenth century, conceptions of disease remained fundamentally systemic. Thus, stimulated nerves did gain in significance, but not really at the expense of other parts of the body with which they were understood to be intimately bound up. Instead, nerve models were combined with older views, so, for instance, the stomach and vapours retained their long-standing centrality in debates on the emotions and the mind.

The sense that the mind and the emotions were in some ways primarily located in the brain and nervous system certainly did become a vital point

of consensus in the eighteenth century. London man-midwife John Leake's *A Practical Essay on Diseases of the Viscera* (1792), for instance, included a supplement on the passions that argued that the nerves were the only significant mediator between the body and mind. He wrote that they were

> so disposed by the Author of nature, that they cannot act separately, but are mutually affected by the sole mediation of the Nerves, from impressions alternately made on the one or other; so that the several passions can only produce their effects, whether good or bad, by increasing or diminishing the influence of these sensible organs on the bodily system.
>
> (Leake, 1792, p. 381)

Willich wrote along similar lines shortly afterwards, dismissing what he saw as outdated ideas about the mind–body link:

> The ancients imagined the seat of the soul to be in the stomach … But it is now universally admitted by physiologists and anatomists, that the operations of the mind are carried on principally in the brain; that this is the point of union, in which all the nerves meet, and which is to be considered as the assemblage of all sensations, or the sensorium commune. The brain is in the most immediate connection with the perceptive faculty; and here all the nerves are as it were concentrated into one point.
>
> (Willich, 1794, p. 374)

There is also a large amount of evidence from lay observers that the idea of the nervous system as the principal mediator between the passions and the body was also widely assumed beyond medical circles. For instance, in 1740 Aaron Hill, a playwright and manager for Handel's operas, wrote to his friend the novelist Samuel Richardson about his health in terms of passions and nerves, clearly assuming that they had a reciprocal influence:

> I cannot close my letter without a word or two concerning your nerves. Your telling me lately that those too sensible feelers are the root of your malady, made the most touching impression upon me in your behalf … I hope, therefore, you have always philosophy enough to balance your mind in that happy serenity which repels all attacks from the follies and vices of others. It is a pity that things we can scorn should have power to disturb our tranquillity.
>
> (Richardson, 1804, p. 1.40)

The correspondence of the English Bluestockings a decade later also reflected the influence of the nerves in discussions of the passions. Writing from Canterbury in 1754, Elizabeth Carter wrote to Catherine Talbot that her "low spiritedness" was the result of her "strange imagination, that a weak system of

nerves is a moral defect, and to be cured by reason and argument." That is to say, that the causes of her condition were physical in character and there was no need to feel guilty about them. On the other hand, Carter suggested that the regimen required to make things better was necessarily related to the emotions, enjoining her friend to cure her nerves by amusing herself, and eschewing study (1809, pp. 2.155–2.156).

Despite the well-attested focus on the nerves, throughout the long eighteenth century, many observers continued to ascribe a major role to other organs and physiological systems. For instance, Mackenzie's *The History of Health* (1763) argued that passions did not only "weaken the nerves" but also tended to "retard the circular motion of the fluids, hinder perspiration, impair digestion, and often to produce spasms, obstructions, and hypochondriacal disorders" (1763, p. 389). The continuing focus on the stomach and digestive system in general in discussions of the passions is one of the most prominent and arguably neglected aspects of the regimen of the emotions in the period, notably in the context diagnoses such as hypochondriasis and biliousness (Andrews and Kennaway, 2016; Miller, 2011; Noyes, 2011; Jonsson, 2005; Vila, 2005; Kennaway and Andrews, 2017). This continuity can be seen in Buchan's description of the impact on the guts of indulging "grief," for instance. He argued that it "destroys the appetite and spoils the digestion; by which means the spirits are depressed, the nerves relaxed, the bowels inflated with wind, and the humours, for want of fresh supplies of chyle, vitiated," a description that would not have surprised Robert Burton in the seventeenth century (Buchan, 1774, p. 86).

The nerves were easily fitted into models that focused on the digestive system, commonly by pointing to anatomy of the nervous system in the guts. For example, Edward Barry, Professor of Medicine in Dublin and Physician General to the Army, in his *Treatise on the Three Different Digestions and Discharges of the Human Body* (1754), combined the nerve model with an approach that maintained the centrality of the digestion, writing that

> The Nerves, which are distributed to the Stomach, and Intestines, are much more numerous, and large, than seem to be necessary for their muscular Motion. … It is therefore more than probable, that the Chyle in its Passage through the Mesentery, is impregnated with a great Quantity of Animal Spirits.
>
> (1759, p. 31)

Likewise, James Makittrick Adair's *A Philosophical and Medical Sketch of the Natural History of the Human Body and Mind* (1787) laid emphasis on the interaction of the nervous system and digestion in the nerves of the bowels, writing that "the stomach and intestinal canal being the grand seat of such diseases as are commonly called nervous; those especially which go under the denomination of hysterical, hypochondriacal, and melancholic" (1787, p. 193). As late as 1829, John Abernethy, Senior Surgeon at St Barts in London, argued in his

The Abernethian Code of Health and Longevity; Or, Every One's Health in His own Keeping, by the Proper Regulation of the Stomach and Bowels that "the stomach is felt to be the centre of every impression on any part of the body or mind, and the seat of muscular exertion and fatigue," possessing "extensive powers, and also universal sympathy with the whole system" (1829, pp. 7, 8).

Lay observers also continued to assume that the digestive system was intimately involved in the interaction of emotions and health. For instance, in a letter to his nephew the Earl of Lincoln, the Whig politician the first Duke of Newcastle wrote explained his wife's illness and lack of sleep by alluding to "a sensation at the bottom of the stomach, where they say the Seat of the Nerves is" (Pelham-Holles). Similar ideas were put into verse in an anonymous poem entitled "An Easy Cure: Or, A P Description for an Invalid when at Bath" from a June edition *The London Chronicle* in 1763. Along with admonitions against opulence ("Luxurious tastes distempers breed"), it advocates emotional restraint for the sake of the bowels and their vapours:

> With inward peace your mind digest;
> Digestion's work is easiest wrought
> By chearful chat, and little thought:
> Or, to disperse black fumes away,
> At Whist or Ombre chearful play;
> Be unconcern'd at loss or gain,
> A spirit ruffled raises pain.
> The mind unbent, your thought prepare
> To bear a part in evening pray'r.
>
> (Anon., 1763, p. 59)

In many ways, the same approach held in the 1820s, when the Lincolnshire physician Edward Parker Charlesworth wrote to Dr. Sutherland at St Luke's Hospital in London to say that a patient's "tepidity" of mind "has some connection with this torpid state of the bowels" (Charlesworth).

Along with the ongoing fixation on the digestion, the role of fluids in conceptions of the relationship between the regimen of the passions and health is one of the most marked aspects of continuity in medical debates (Starobinski, 1966). Iatrochemical medicine reconfigured the liquid humours, giving obstructions and chemical reactions more attention than imbalances, as can be seen in Michael Stolberg's chapter in this volume (Knoeff, 2002). The emblematic character of George Cheyne's *The English Malady* (1733) in discussions of the development of the medicine and culture of nerves and sensibility has led to a sometimes partial view of his actual model of how the passions related to the body. An examination of his work, much of which essentially dealt with questions of regimen, shows that instead of a narrow focus on psychology and stimulation, he understood the relationship primarily in terms of blocked tubes and digestion, with the traditional view of the humours. His description of the impact of "acute passions" demonstrates the

way his thinking on the nerves retained an obvious link to the medicine of solids and fluids of Herman Boerhaave and Friedrich Hoffmann. The passions, he wrote,

> effect a brisk and lively Circulation of the Fluids, crisp up and constrict the Solids for some short Time. Thus sudden Gusts of Joy or Grief, Pleasure or Pain, stimulate and spur the Nervous Fibres, and the Coats of the Animal Tubes, and thereby give a Celerity and brisker Motion to their included Fluids, for the same Time. And the Functions of the Heart and Lungs being involuntary, they have their more immediate Effects upon them.
>
> (Cheyne, 1725, p. 153)

At the very end of the eighteenth century, Willich was still putting his warnings about the medical dangers of indulging in "peevishness" in terms related to excess bile fluid, not in excessive quantities as in the humoral model but because of its "retarded circulation," which would lead to "jaundice or dropsy," leaving the mind to be "totally employed in contemplating its wretched situation" (Willich, 1809, p. 356). The idea of nervous fluid travelling in tubes, which survived in various forms throughout the period, also provided continuity with iatromechanical and indeed humoral medicine.

An examination of the topic as discussed by non-medical writers also provides evidence of the influence of the concept of bodily fluids in understandings of the impact of the passions of health. The worldly John Douglas, later Dean of Windsor and Bishop of Salisbury, born in Pittenweem in Fife, included a discourse on the passions and health in terms of obstructed fluids in his 1754 attack on David Hume:

> For by the operation of the passions of the mind on the spirits, they may be so determined as to produce great alterations in the motions of the blood, and to Communicate such life and briskness to it, as will have a natural efficacy to give relief under diseases whose seat is in the fluids. By this means may the obstructed canals be opened, the stagnating juices may resume their lost circulation, and the relaxed solids recover that proper tone, which a sound part, oppressed by too great a quantity of fluids, could not preserve.
>
> (Douglas, 1807, p. 161–162)

Like fluids, vapours also continued to have a key role in understandings of the passions and health. Although the idea of young ladies suffering from "the vapours" in relation to some emotional shock is one of the most overused clichés of the period in the popular imagination, scholarly attention has tended to play down this model of the interaction of the passions and health in favour of the more obviously modish and innovative focus on nerves. Vapours, often seen as literal gases rising to the brain from the digestion or elsewhere in the

body, had long been a feature of medical explanations of how the body could affect the mind. While this model persisted in various forms, the Enlightenment saw a sustained attack on this view. For instance, in his *Treatise on the Spleen* (1725), the English poet and physician Richard Blackmore adopted a sarcastic tone about the idea of vapours rising from the womb to cause hysteria or from the bowels and spleen to cause hypochondria:

> No thing was ever so crudely and so ill imagined as the Hypothesis of the Ancients, which likewise has been espoused by a great Part of modern Physicians. … As the primitive Practicers ascribed Hysterical Passions to noxious Fumes and Vapours, ascending I know not how, from the Womb, so they fancied that Hypochondriacal Affections have their Rise from dark and windy Steams and Exhalations elevated from the Spleen.
>
> (Blackmore, 1725, p. 1)

Other observers suggested that the language of vapours had become entirely figurative. For example, the Abbé le Blanc's 1767 *Letters on the English and French Nations*, which was well known in Britain, wrote that while he did not "deny that there are real vapours," they should be "regarded only as a mark of a depraved imagination … In the greatest part of men the vapours are nothing but violent uneasiness: and I own that uneasiness is the most cruel of all distempers" (1767, pp. 181–182).

Despite this critique, vapours continued to be a feature of conceptions of the passions and the body, even for physicians most closely associated with nerves. For instance, Robert Whytt's *Observations on the Nature, Causes, and Cure of Those Disorders Which Have Been Commonly Called Nervous, Hypochondria or Hysteric, to Which Are Prefixed Some Remarks on the Sympathy of the Nerves* (1765) suggested that, "A disordered state of the stomach and intestines, with wind or noxious humours lodging in them, will sometimes so affect the brain, as to deprive people of their reason" (1765, p. 21). This had considerable significance for regimen, with Whytt suggesting that this is the root of the symptoms of a hangover. "The headach, after a debauch, proceeds chiefly from the stomach," he writes, before seeming to advocate hair of the dog as a solution, referring to "the removal of the pain, upon drinking a few glasses of strong wine" (1765, p. 21).

By the Victorian period, the six non-naturals were looking like an antiquated framework for discussions of medical advice on lifestyle. At the same time, the rise of hospital medicine with an emphasis on local pathology reduced the significance of emotions in understandings of the symptoms and the aetiology of disease. As nosology became more focused on evidence gained from systematic post-mortem investigations, assumptions about the interaction of passions and the body were rather undermined. The advent of germ theory in the second half of the nineteenth century reinforced these trends. The holistic approach to problems of psychosomatic and somatopsychic medicine that had been commonplace in the eighteenth century faded, as anatomo-clinical approaches came to dominate understandings of the body and the emerging

field of psychiatry took on the mind and the emotions. However, it is also the case that the emotions never really went away, for all the advances in materialist medicine. Physicians continued to see the role of the passions in their patients' suffering from their own experience and developments such as increasing understandings of the hormones from the late nineteenth century put the emotions back into consideration (Sengoopta, 2006).

Conclusion

Advice on regimen relating to the passions in Britain during the long eighteenth century, as we have seen, remained generally conservative, drawing heavily on traditions that stretched back centuries. This mirrored the broader character of Enlightenment medicine, with radical changes in understandings of the body being combined with remarkably traditional models, diagnoses and treatments. Thus, theories linking the passions to the nerves were assimilated into approaches based on the guts. To a large extent, ideas about how to maintain emotional balance for the sake of health continued to be based on Hippocratic and Galenic thinking, combined with the philosophical inheritance of Stoicism and Christian moralism. It was a contribution to an ideal of a stable social order in which excessive feelings had no place. At the same time, dietetics also reflected changing medical models and the dynamic nature of eighteenth-century European societies. In particular, ideas of health and sickness being the consequence of levels of nervous stimulation lent themselves to a new critique of modern urban lifestyles, laying the foundation for medicalised attacks on the excessive emotions of over-stimulating "decadent" culture that have been a recurring feature of Western societies ever since.

Notes

1 It is important to note that the eighteenth-century concept of the passions and the accompanying terminology was rather different than today's understanding of emotions. While in this chapter, the word "emotion" will be used rather loosely, the eighteenth century retained a sophisticated older terminology for what today would be subsumed under that heading, the word "passion" being reserved for more violent feelings, "affection" for less extreme feelings such as kindness and "sentiment" for things that appeared to combine thought and feeling. In his dietetic book, Florian Anton Willich put in the following terms: "Affections and passions are different one from another in degree only. The former imply the inclination or propensity to a passion; the latter, the realised affections, whether simple or compound;" or in other words, they constitute an actual and perceptible degree of sensual desire or aversion. According to Lord Kaimes, passions are active and accompanied with desires; affections are inactive and destitute of passion. He also distinguishes between wishes and desires: the former he calls the highest activity of the affections. Compassion and wishes for the better are in his idea affections: pity, and a desire after what is better, he calls passions (Willich, 1809, p. 335).
2 Writing in the 1830s, the American Edward Hitchcock gave a striking example of the power of passions to lead to death. "Sudden grief has sometimes proved alike fatal. Philip V of Spain died suddenly on learning the disastrous defeat of his army; and on dissection

it was found that his heart was literally burst asunder; showing that the common phrase, a broken heart, is sometimes pathologically correct" (Hitchcock, 1831, p. 259).

3 The Roman poet Juvenal's motto can be found in his *Satire X*: You should pray for a healthy mind in a healthy body./Ask for a stout heart that has no fear of death,/and deems length of days the least of Nature's gifts/that can endure any kind of toil,/that knows neither wrath nor desire and thinks/the woes and hard labours of Hercules better than/the loves and banquets and downy cushions of Sardanapalus./ What I commend to you, you can give to yourself;/For assuredly, the only road to a life of peace is virtue."

4 Of course, this issue, a version of what David Chalmers famously called the "hard problem of consciousness," which in many ways has not been satisfactorily resolved today either.

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Epilogue



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14 "That is more excellent which preserveth health and preventeth sicknesse"[1]

Continuity and change in vernacular preventive health advice over the early modern period

Tessa Storey

Introduction

Thomas Cogan's *Haven of Health* (1584) was a guide to healthy living for students and "all those that have a care of their health" (Cogan, 1636).[2] It was a fairly typical example of one of the scores of health advice texts, known as *regimen*, which were circulating in Europe by the later sixteenth century. As he explains, the aim was to show readers the "order of how health may be preserved," by advising them on how to organise the day-to-day activities which governed their health, usually by dividing the non-naturals into separate chapters for ease of reference (Cogan, 1636).[3] They explained such matters as how readers could improve the air quality within their homes; what could be eaten and drunk and in what order; the daily hygienic procedures necessary for removing excretions from the surfaces of the body; the appropriate types and amounts of exercise; sleep routines and how to moderate one's "passions" – or emotions. Given that Galenic preventive physiology was premised on the notion that each individual had to tailor the management of the non-naturals according to their own particular constitution, the local climate and the season, these texts could be quite lengthy.

By the time Cogan's book appeared, the regimen genre was already very well-established (Wear, 1992a; Mikkeli, 1999; Sotres, 1998; Nicoud, 2007). Following on from the first translations of dietetics advice from the Greek and Arabic between the eleventh and twelfth centuries, physicians had started to author their own regimens for powerful patrons or to provide "handbooks" for other physicians and medical students (Nicoud, 2007, pp. 15–18, 144). The advent of print made this knowledge accessible for ever-widening readerships and printers evidently found they had a public avid for this kind of guidance. Although dense folio volumes and Latin regimens continued to appear throughout the period for a highly educated, often professional readership, by the early sixteenth century, authors were increasingly writing regimen in the vernacular, in relatively small and cheap formats so as to be affordable to the

"middling sort" (Wear, 1992b; Fissell, 2007, 2011; Cavallo and Storey, 2013, 2017). Soon some authors also began to innovate in terms of both contents and structure – essentially leaving the regimen genre behind. One approach was to select a single non-natural such as food and drink, or a topical debate such as Lenten diets, the benefits and dangers of hot and cold drinks, or the health benefits of coffee or chocolate.[4] A trend which took hold specifically in Italy was to write regimens for people living in particular cities, given the importance attributed to the influence of local climates on health. Meanwhile, plague tracts often included preventive advice as well as remedies for plague and were common across Europe.

It has been suggested that an interest in dietetics more or less faded across Europe in the second half of the seventeenth century.[5] Whilst it is true that there was a dramatic decline in vernacular preventive medical publications in Italy after the mid-seventeenth century, the same certainly does not hold true for other countries.[6] In England, for example, there was no obvious change in the rate at which preventive health publications appeared. At least six new regimens or translations of foreign regimens appeared between 1650 and 1700, added to which were the multiple publications on prevention by Thomas Tryon and Nicholas Culpeper (for example, Culpeper, 1656). The first section of John Locke's *Some Thoughts Concerning Education* (1693) discusses the management of all the non-naturals when raising children and went through an estimated 53 editions in multiple languages (Pickering, 1981, p. 10). The eighteenth century saw such bestselling tracts as the *Essay of Health and Long Life* (1724) by George Cheyne, and the success of William Buchan's *Domestic Medicine* (1769) shows that interest in the topic had remained undiminished over the century.[7] In France, vernacular regimen only really became popular in the early seventeenth century; however, at least 23 appeared by 1702 and another 12 by 1800.[8]

Why an interest in writing vernacular regimen should have shifted to the north of the Alps after 1650 is unclear. Donato has shown that physicians and natural scientists in Italy had not lost interest in prevention. It was just that the focus of their work had switched to a concern with public health and the regulation of air quality, drinking water and foodstuffs. She places this within a bigger political framework, as practitioners sought to acquire "closer connections with political power" rather than concern themselves with matters like sleep and exercise which remained in the private realm (Donato, 2017, p. 173). However, as is documented in several chapters in this book, in northern Europe authors and markets seem to have shared a concern with public health whilst retaining an interest in "individualised" vernacular preventive publications (Cheyne, Buchan, Tissot being the most obvious examples).

The six non-naturals: fragmentation of a holistic system?

A glance at almost any of the regimens published up to the mid-seventeenth century illustrates how closely the six non-naturals worked together. Although authors took readers through explanations of how to manage each of them one by

one, the ways in which they interacted were repeatedly emphasised. For example, instructions relating to going to bed are given with careful attention to mealtimes, whilst one's exercise routine needed to be tailored around one's excretions and meals. Hence, Elizabeth Williams' observation that any discussion of a single non-natural "does some violence to the holistic character of pre-modern medicine" (p. 73 in this volume). Whilst the preventive health paradigm relied on interconnections between all six non-naturals, there was a particularly intense "feedback-loop" between eating, exercise, excretion and sleep. For example, sleeping too little or too much, or at the wrong time in relation to one's meals meant that food was not "concocted" (digested) properly, which could result in various kinds of plethora, blockages, corrupted humours and so on. Hence, the standard advice throughout the Middle Ages and Renaissance involved complicated instructions about when and how often one should turn onto which side so as to facilitate the descent of food towards the stomach (Durante, 1643, p. 28–29).

One important question arising from this volume is whether there was a gradual shift in the "equilibrium" and interconnectedness between some of the non-naturals by the mid-eighteenth century. This is particularly pertinent to the discussions of sleep and exercise. It has recently been suggested that after the publication of Thomas Willis' key works in the 1660s, the operation of the brain and nervous system became increasingly prominent in discussions of sleep, until eventually they were prioritised over the relationship between sleep and digestion (Handley, 2016). The principal sources discussed by Schmidt in this volume support this observation, showing a gradual loss of intensity in the relationship between sleep and digestion over time. Floyer's treatise (1707) is the earliest he mentions, but it is also the most innovative. Framed in the context of his study of pulse rates, he barely mentions any rules for sleep and certainly divorces it from digestion. He just inserts brief sentences such as "If one has poor circulation, one should sleep little; If it (the pulse) runs quickly, we may sleep for nine hours; Irregular motions of the spirits are stopped by sleep, rest" (Floyer, 1707, pp. 87, 89, 157, 169). Despite being written nearly two decades later, George Cheyne's advice on sleep in his *Essay on Health* embraces much more traditional advice, but this is presented more loosely, as a number of general principles rather than the strict sleep discipline of the late sixteenth-century. Moreover, although he is still focused on digestion and excretion, his iatromechanical views result in a shift away from detailed discussions of food-stuffs, to simply advising one to avoid large quantities of food which "load" the stomach, and to keeping the "alimentary organs easy, quiet and clean" (Cheyne, 1724, p. 79). John Trusler's popular tract on health, which went through five editions at the end of the eighteenth century (1790), shows much greater regard for the relationship between sleep and digestion, but this only betrays his reliance on much older sources: it could have been written at least 200 years earlier.

Hence, I would argue against Schmidt's suggestion that the advice on sleep given by these three authors shows the effects of scientific interests in time and measurement, becoming "thoroughly mechanistic" in terms of sleep discipline

(p. 185 in this volume). On the contrary, I view their approach to sleep as being actually *less* disciplined than the norms established by the sixteenth century. Rather, the influence of iatromechanism meant that these authors understood that the body would proceed with the process of digestion regardless of how one slept, so there was no longer any need to regulate this. But this also illustrates one of the difficulties with using vernacular regimen. Since they were often the product of a commercial operation and often not by physicians, they could be extremely derivative in their content, despite bearing a preface that made bold claims for the novelty or efficacy of their approach.

On the other hand, the other largely non-medical sources discussed by both Hunter and Schmidt do reveal important shifts in the perception of sleep in broader cultural discourses. Wesley's texts and the literary critiques of the sleep habits of the elites are a striking example of how sleep is wrenched out of its traditional framework as an element allied to health and reframed instead in terms of morality, self-discipline and concerns with wasting and utilising time meaningfully.

Likewise, the management of evacuations was intricately bound up with diet and exercise. In his discussion of excretion, Stolberg points out that "countless works on dietetics recommended moderation in eating and drinking," making the link for us between his chapter and Guerrini's chapter (p. 208 in this volume). Dietary advice aimed to help one avoid accumulating poorly digested matter in the body in the first place. The authors of most regimens would also have considered that rather than following the kinds of extremely restrictive diet advocated by Cornaro and Cheyne, one should simply take enough exercise.[9] Exercise affected one's inner heat and the production and circulation of vital spirits in the body. This determined how successfully one concocted one's food, which prevented the production of superfluities and increased the speed with which fluids and excrements moved through the body. Moreover, by raising body temperature and opening the pores, exercise enabled fine particles and superfluities in the form of vapours to escape the body (Fonseca, 1603, pp. 11–12; Bertaldi, 1620, p. 20).

Although Galen had discussed exercise in relation to strengthening and hardening the body, a close connection was also posited between exercise, food and excretion in Galenic physiology (Cavallo and Storey, 2013, pp. 146–147). This was gradually weakened by new understandings of the body, particularly by iatromechanism and iatrochemistry. In his chapter on movement and rest, Cheyne, for example, reiterated the importance of exercise for health, but his emphasis shifted to a more generic sense of its role in keeping juices "thin" and strengthening the muscles and nerves. "Our bodies are so made and the animal oeconomy now so contrived that without due labour and exercise the juices will thicken, the joints will stiffen, the nerves will relax and on these disorders chronical distempers and a crazy old age must ensue" (Cheyne, 1724, pp. 90–91). Sanislo's discussion of exercise in the late eighteenth century shows a much later stage in this kind of uncoupling of the non-naturals from one another and even from their original "functions" in the overall framework

of Galenic physiology. Although her sources placed much emphasis on the *health* of the well-exercised body, exercise is not mentioned as part of a holistic system and certainly not in relation to digestion, but only in conjunction with notions of strength, hardness, firmness and masculinity.

Yet not all the links between non-naturals were disintegrating. In contrast to these possible "uncouplings," Kennaway finds evidence of the opposite trend when it comes to the passions and digestive health. He describes a kind of "dogged persistence" in the links between these two non-naturals, which he argues scholars have tended to overlook in favour of a focus on the "nerve model of the mind-body connection" (p. 265 in this volume). He shows that up until even the nineteenth century, disordered passions were still seen as having a negative impact on the digestion – and vice versa – with multiple ill-effects, including the production of dangerous "vapours" which were thought to interfere with the brain. Indeed, looking back at mid-sixteenth-century discussions of the passions, more than simply persisting, I suggest that this link between the stomach and the passions actually intensifies. Although links between the digestive system and brain had always been fundamental to understandings of melancholy, it was not until the late sixteenth century that ailments which had previously been considered as arising from separate causes were increasingly being attributed to problems in the mesenteric system – the liver, spleen and surrounding area – the "hypochondria" (Zacchia, 1639, pp. 1–3). These illnesses were then collectively described as "hypochondriac" in origin and "hypochondriac melancholy" was one of the most significant of these. The first treatises on the topic were published in the early seventeenth century and as we can see from Kennaway's observations, these notions were still flourishing well into the eighteenth century.[10]

Moderation

Given that the traditional regimen is implicitly about obtaining an equilibrium between each of the non-naturals, notions of moderation and balance in one's daily life in general have always been inherent to preventive health advice literature. So ubiquitous is the term "moderation" that it has been taken as a sign of the almost static nature of this genre over the centuries (Shapin, 2003).[11] That is perhaps partly due to the fact that moderation now lacks the resonance it had in the literature of the early modern period when it was freighted with centuries of use in philosophical, religious and moral texts dating back to Classical Antiquity (Sotres, 1998, pp. 291–318; Pucci Donati, 2007). Temperance and self-discipline of bodily appetites were amongst the ideals of a holy life and duties of a good Christian and moderation was therefore bound up with notions of virtue, self-care and moral rectitude. It was a qualification for and expression of one's social status, and reference was frequently made to the idea that if you couldn't govern yourself, then you would be unable to govern others (Nicoud, 2008).[12]

Both Kennaway and Thormählen show how crucial these ideals of moderation were right into the nineteenth century, particularly when it came to

discussions around the management of the passions of the soul. According to Galenic physiology, immoderate passions could provoke illness, and even sudden death, through sudden alterations to the body temperature. Thus, it was important for the rational part of the soul to have the upper hand over the "irascible" and "concupiscent" "animal" appetites connected with the heart and liver (Paschetti, 1602, p. 227; Fonseca, 1603, pp. 113–114; Carerra, 2013, pp. 124, 136). Only one passion, cheerfulness (*allegrezza*), the "moderate" passion par excellence, was always thought to have a positive impact on one's overall health, as it caused the spirits move gently and harmoniously. Hence, the most consistent advice given with respect to avoiding immoderate passions was to seek out situations which promoted cheerfulness (Ludke Finney, 1962, pp. 143–154; Cavallo and Storey, 2013, pp. 194–206; Yallop, 2013, pp. 83–104). In this respect, there seems to have been little change in the eighteenth century, as Kennaway documents the principal "diversions" which were recommended such as participating in social gatherings, talking to good friends, reading (the right kind of books) or listening to music, all of which had featured over the centuries.

Yet even though there are strong continuities in this advice, these two essays also trace important shifts. In the sixteenth century for example, there was a great emphasis on the role of the senses, especially sight, in avoiding melancholy (Gage, 2008, 2017). Readers were encouraged particularly to spend time outside, breathing delightful scents and looking at anything which was green, colourful, shiny or translucent since the animal spirits would be "cheered" by these and "returned," invigorated, to the body. But it would seem that by the eighteenth century, the role of hearing – as in listening to music – had assumed much greater importance in moderating the passions, perhaps even replacing sight in that capacity. This is not to say that music had been ignored in earlier centuries: on the contrary, it had long been understood as having a tremendous impact on the passions. Yet, there is a general consensus amongst historians of music that apart from vague recommendations to listen to music, there was no developed body of medical theory, nor set of examples, about precisely how music could be used in a practical way to assist in the moderation of the passions (Burnett, 2000; Horden, 2000; Gouk, 2004).

Governing one's food and drink was arguably the most difficult aspect of a healthy regimen and the one where the notion of moderation was most likely to be reiterated. Yet as Guerrini shows, "moderation" is meaningless unless we analyse texts in their historical contexts. Her conclusion, that there was no consensus on what "moderation" meant, is perhaps inevitable, given that Galenic physiology saw each individual's constitution as unique, rendering a "one-size-fits-all" model all but impossible. Moreover, the treatises by Cornaro, Lessius, Tryon and Cheyne were all particularly extreme in their orientation, essentially "outliers" from the traditional Galenic regimen – which is arguably why they are so interesting to modern scholars. One of the things which set them apart was their determination to jettison age-old advice on nutritional qualities even though, as Guerrini points out, except for

Tryon they were "playing safe" to some extent by basing themselves around the traditional diet for convalescents. They also all downplayed (though only Tryon more or less ignored) the importance of the other non-naturals. Having removed the implicitly regulating functions of the other non-naturals, all these authors therefore had to create new definitions of moderation in relation to their new parameters, whether this was by weighing one's daily food and drink intake or by outlining a very restricted dietary regimen. Something similar happens in the moralising debates on sleep promoted by Wesley and described by Schmidt. His evidence suggests that once sleep has been disconnected from its old anchors of the other non-naturals, "moderation in all things" is replaced with a much harsher "monitoring" of all things but linked to the clock.

Williams also highlights ways in which the discourse of moderation was gendered. As long as the ability to "be moderate" was linked to rationality, virtue and other "male" qualities, as it was throughout the Renaissance, women were seen as less moderate than men. Hence, they were more prone to uncontrollable and immoderate "appetites" of various kinds, whether chlorosis, pica or self-starvation – at either end of their reproductive life cycles. She also shows how Enlightenment medical discourse reframed the way women were positioned as regards their appetite. The binary distinction was no longer between "rational" and "animal" but between nature and culture, rural and urban. From this perspective, as long as women were aligned with "nature," "natural appetites" and preferably a "rural" environment, then they would be demure, restrained, moderate and controlled. It was only when they were influenced by urban living and its over-stimulating culture that they lost this "natural" ability to moderate their behaviour and eating and succumbed to "desire."

Healthy living and social elites

Late medieval regimens were initially destined for the social and intellectual elites, whether for rulers or scholars. Accordingly, they made it very clear which kinds of foods were considered medically appropriate for the elite body, and thus "legitimised aristocratic food choices" (Depecker, L'Huissier and Maurice, 2013, p. 21). Even once regimen began to circulate in print in the vernacular and their intended readerships broadened, clear demarcations were still made between the kinds of foods recommended for people of different classes (Grieco, 1999; Albala, 2002; Nicoud, 2013). Less widely appreciated is that exercise was also an important marker of social difference. Castiglione's treatise *The Courtier* (1528) set out the ideals of grace, restraint and nonchalance in bodily movement for the elites. These gradually prevailed across Europe in the sixteenth century and were echoed in the advice on exercise given in regimen. Subsequently, in Italy, Counter-Reformation ideals of "sobriety" and "gravity" also came into play and sweaty, violent, intense physical activity was associated with the labour and entertainments of the "vulgar" and common sort (Cavallo and Storey, 2013, 2016).

Singing was amongst the forms of exercise considered useful for the bodies and intellects of the elites; a tradition which Thormählen's chapter makes clear was continued into the eighteenth century. Whilst its uses for the chest, throat and lungs were universal, its impact on the spirits and by extension the intellect are discussed in relation to improving the intellectual capacity of its readers. In his best-selling *Tesoro della Sanità* (1586), Durante mentions the importance of "speculating, singing psalms, and singing with instruments, listening to tales from theology: all these things delight the soul, feed it, strengthening the virtues" and "strengthening the soul, making the memory perfect: Thereby men become learned and fit for the governing of republics" (1643, pp. 18–19).[13] It is interesting to see that the beneficial impact of singing on the intellect was still acknowledged by Browne in the early eighteenth century, and still in the context of moderating the passions of elites, even though it was now reframed in terms of iatromechanics.

Many sources also point to the failure of the elites to live in a manner appropriate to their responsibilities and power. The call to "moderation" was often part of a critique of the lifestyles of the courtly elites, aristocrats and gentry as the principles of moderation and temperance were inimical to the lifestyles of the elites (Nicoud, 2008). "Alimentary ostentation" was an integral part of life at court, as were the many other festivities, hunting parties and so on, none of which showed any respect for "orderly living" and yet "made up an important part of elite group identities" (Nicoud, 2013, p. 59). Indeed, Alvise Cornaro (who was a nobleman) introduces his treatise with a criticism of the "excesses" of the nobility in sixteenth-century Italy, claiming that "excess is felt to be a virtuous and honourable thing and a sober life dishonourable, belonging to the miserly man," and his treatise aims to readjust these values (1630, p. 72).[14] Many other authors of regimen who also condemned such lifestyles were provincial rather than court physicians, representing the opinions of lesser gentry, merchants and professionals, presumably the readership to whom they were addressing themselves.[15] Several of the essays here show these tensions of class and status being played out. Hunter explores the critiques made against the disorderly sleep routines of eighteenth-century English aristocrats in literary sources which, she argues, represent the voice of the rising mercantile, urban bourgeoisie, dismayed at the lack of restraint shown by their social superiors. As she points out, *disorderly* sleep increasingly became an important status marker, perhaps also as a reaction against the worthy notions of "husbanding" time promoted by the Methodists whom she and Schmidt refer to. Likewise, in Sanislo's chapter, it is members of the bourgeoisie who were articulating their new cultural ideals as they levelled criticisms against the "unhealthy," "soft," "weak" bodies of the upper and educated classes in eighteenth-century Germany, seeking to remake the image of the elite body into something more warlike. Presumably, the ideal forms of exercise for that elite had been similar to those of their Renaissance Italian counterparts: prizing gentle, elegant activities above rough, vulgar displays of strength.

Age, sex and gender

Providing advice on the management of the non-naturals for bodies of all constitutions and ages had always been an integral part of healthy living advice. Galen started his *De Sanitate Tuenda* by working through the needs of babies and children up to the age of seven and then adolescents before moving on to the adult male body. Avicenna's *Canon of Medicine* (1025) contained different regimen for babies, adult men and the elderly. Several regimens from the fourteenth century onwards included sections directed at these different age groups and Ficino's *Delle Tre Vite* (1548) was addressed to scholars, who were implicitly elderly men.[16] However, for the most part, a generic adult body was the primary focus of interest for most authors, particularly as the vernacular printed regimen sought to be pertinent and commercially viable to ever wider social groupings.

A key problem is whether the female body was ever considered to be included in this broad readership – given that the first known regimen purely for women did not appear until 1771 in French.[17] This is an issue which Williams addresses in her chapter on the ageing female body where she posits that early modern texts on longevity "spoke to the needs and practices of males" and that this only began to change in the Renaissance with a focus on the "maladies of women." She also observes the long-standing failure to engage with the significance of the cessation of the menses in older women's lives: whether as regards timing or the health implications. It is certainly true that the female body is barely mentioned in general preventive health texts in England and Italy until the mid-sixteenth century other than, as Williams points out, to pass occasional comments such as forbidding a particular wine to women or a type of food during pregnancy.[18] However, this in itself suggests the possibility that a mixed readership was intended and the assumption that men and women could benefit equally from such general texts. After all, the standard principles of how to govern the non-naturals were applicable to both men and women: how to sleep, procedures regarding bodily hygiene, the importance of good air, the dangers of extreme passions and so on were essentially gender neutral. The nuance lay with regard to different complexions and ages and women were implicitly catered for within the category of phlegmatic bodies, since they were "colder by nature than man, and of weaker complexion."[19] This was a difference which presumably could be adjusted through food and exercise. However, over the sixteenth century, the commercial possibilities of targeting women more specifically must have become apparent and so publishing strategies shifted. At first this was manifest just through an increase in dedications to women or references to them as readers in prefaces, but soon publishers and physicians were beginning to see a market opportunity in the complex issues surrounding women's fertility, childbirth and lactation (Cavallo and Storey, 2017, pp. 36–37). In Italy three texts appeared between 1563 and 1602 addressing topics such as conception, menstruation, prolapsed wombs, management of labour, infant care, lactation, wet-nursing and the health of

nursing body. Although they were not *regimen* in the traditional sense, they contained scattered advice on the non-naturals or more substantial chapters on regimen for the pregnant or post-partum women.[20]

By gathering all this information together into one place, we can see the emergence of a literature which acknowledged the differing applications of the non-naturals to the male and female body. Arguably, this represents an important moment in the transition from the unitary Galenic body to the inherently distinct male and female bodies envisaged by eighteenth-century medicine, as discussed by Elizabeth Williams in her chapter and elsewhere (2003). Indeed, she documents the continuation of this process of differentiating between bodies, as she observes that towards the end of the eighteenth century, physicians paid "persistent attention to variety and difference," increasingly constructing "multiple" female bodies all needing to be treated differently according to age, nervous constitutions, whether they are single, childless, or mothers and whether living in rural or urban environments (p. 76 in this volume).

Male bodies were also singled out for special treatment in regimen, particularly with regard to exercise where there was a long-standing tension between the need to "shape" and toughen up male bodies for warfare and the need to distinguish the body of the elite male from that of the lower classes. In the fifteenth and early sixteenth centuries, as the republics on the Italian peninsula warred with one another and with the Holy Roman Empire, civic defence was an imperative. Humanists wrote extended guides for the education of youths which sought to prepare elite men for battle, drawing particularly on Galen's emphasis on the role of exercise in hardening and strengthening the organs and limbs. They praised the role of vigorous physical exercise which provoked sweat and fatigue, arduous physical challenges, physical deprivation such as sleeping outside and cold bathing as ways of toughening the body of youths for endurance, warfare and glory. Likewise, in sixteenth-century Germany when towns relied on civic militias for their self-defence, they encouraged martial sports and competitive events which celebrated and developed skill, strength, violence and endurance (Tlusty, 2016). But subsequently in both Italian and German states, ideologies of the appropriate exercise for elite males shifted away from this militaristic, hard body, as armies were professionalised and men of higher status freed from the burden of defence. As noted earlier, the ideal for elite men then shifted to a more graceful, restrained and less militaristic style.

Sanislo's chapter demonstrates that by the mid-eighteenth century in Germany, a more extreme discourse of gender dimorphism had emerged which relied on presenting the male body as being diametrically opposed to and superior to the female body. Vitalist medicine represented women as "naturally" more inclined towards domesticity, softness, a life of lassitude and laziness; these were notions which reinscribed women's bodies in the domestic context and, for elite women, to an urban context. In order to prevent the "feminisation" of men, therefore, it was important to remove male bodies from the "domestic" and "civilised" sphere and ally them instead with "natural" living (Williams, 2003, pp. 243–4, 235). Yet it is also intriguing to see how they

attempted to overcome the various ambiguities which such binary distinctions between male and female strength created. One of these was the problem that women also needed to be strong enough to bear generations of healthy children, without sacrificing their "femininity." The solution was not unlike that which had prevailed several centuries earlier: women should take exercise, but apart from walking and perhaps dancing, it should be that kind which naturally arose within the domestic sphere and when doing domestic chores.

Air, climate and place

The importance of the weather, winds, air and seasonal change on health permeate two Hippocratic texts – *Epidemics I and III* and *Airs, Waters and Places* – which had long provided a template for medical thinking about the impact of the air and local environments on the body. Indeed, as far as the regimen is concerned, there was no break in continuity with respect to the importance of "good" air for health from the late Middle Ages through to the "revival" of Hippocratism in the eighteenth century. Rather, a shift in emphasis within regimen meant that by the eighteenth century, "Air" stands out as probably the single most important non-natural (Conforti, 2017; Donato, 2017, p. 168).

The purity, humidity and temperature of air had always been implicated in good and ill health. In particular, authors up to at least the mid-seventeenth century were concerned that inhaling ill-smelling, "putrid" or "corrupt" air from whatever source (marshes, graveyards, stagnant pools etc.) was responsible for causing disease, particularly plague. Whilst different models were developed for how "corrupted" air caused ill health, what was crucial was instructing readers on how to recognise and avoid such air (Arrizabalaga, Henderson and French, 1997, pp. 234–250). In the early seventeenth century, regimen still relied extensively on visual metaphors to describe air: good air and bad air were something which you can see and smell. Good air is clear, crystalline, luminous, shining, and is related to open skies. It is also sweetly scented.[21] Bad air not only smells unpleasant but is related to bad weather and human activity and can also be clearly seen: it is "muddy" and "dark, thick, dense, cloudy, and sooty."[22] It may also contain larger, denser particles as a result of mixing with other elements like soils, or putrid matter which make it "thick," "large," "heavy" and "dense," whilst good air is "light," "rare" and "thin."[23]

In the course of the seventeenth century, the enquiries of natural philosophers and physicians overlapped in a quest to understand the chemical composition of the air and to relate this to the impact of specific, local, meteorological and geological phenomena. This generated a significant shift in how the impact of the air on the body was conceptualised as we see in Knoeff's chapter. The late eighteenth-century Dutch physicians whose works she presents were informed by contemporary understandings of air pressure, an 'obsession' with fluids and fibres, concerns about the porosity of the body and widespread circulation of contagion theories. The air is no longer discussed as something smelt, or seen, but as an element which "surrounds" and "presses" on the body

and passes through the skin to affect one's health and mood. People may feel this pressure within them as a "heaviness" in their bowels. Lower air pressure was felt as an absence, depriving the body of support which then explains a sense of general weakness. Meanwhile, there were widespread fears that invisible noxious particles were "sneaking" into the body through the pores to effect chemical changes.[24]

Knoeff's chapter also illustrates the extent to which disparities emerged within British and Dutch conceptions and constructions of the body in the eighteenth century, reminding us of the importance of considering national variation in early modern medical discourse (Conforti, 2017; Storey, 2017). Despite the fact that we often consider Enlightenment intellectuals as operating within a broad European landscape of scientific discovery and exchange, she shows the "national" focus of many medical discussions: the evolution of distinctively "Dutch" medical arguments about physiology and the way in which the Dutch climate was understood as creating powerful healthy Dutch bodies. This certainly resembles the way in which earlier medical discourse in England was manipulated not only to forge an image of the strong healthy Englishmen but to promote the colonisation of North America, by portraying its climate as ideally suited to the English body (Wear, 2008). As Knoeff points out, the weather and climate were "part of a lived experience; it determined how people felt, the health of their bodies and how their constitutions were grounded in the lands they inhabited."

In accordance with Hippocratic teaching, the belief that bodies were "grounded" in their specific environments had become increasingly influential over the sixteenth century, particularly in Italy. In order to make readers aware of the challenges and benefits of their own specific local climates, physicians started tailoring advice to readerships grouped according to cities and by 1602 specific health advice tracts had appeared on Venice, Rome and Genoa (Cavallo and Storey, 2013, pp. 78–80; Donato, 2017, pp. 170–173). Indeed, increasingly authors focused on even smaller local areas – such as specific villages or quarters of a city (Conforti, 2017, p. 152). It follows that since health problems were associated with specific places and it was thought that bodies adapted to their native climate, travelling exposed them to changes which could pose a threat to health. Avicenna's *Canon of Medicine* (1025) had recognised this with a short regimen for those travelling in hot climes. In 1602, the regimen published by Bartolomeo Paschetti was framed as a discussion between a physician and some Genoese noblemen travelling to Ferrara so as to provide them with health advice as they negotiated the different "climates" en route. If the journey between Genoa and Ferrara was considered hazardous, how much more so a journey across the globe? As the sixteenth century progressed, global trading networks increased as did the number of colonies and settlements established in far-flung continents. This created an urgent need to provide health advice for the vast numbers of men forced not just to travel beyond Europe but to live there for lengthy periods. This prompted the emergence of another sub-genre of preventive health advice literature starting in

the first decades of the seventeenth century, initially amongst the Dutch and Portuguese but soon also emulated by the British. As Snelders shows, this started with reports, letters and personal testimonies about the dangers of hot climates, but soon naval physicians and surgeons were drawing on their experiences to address those responsible for sailors and soldiers encountering these hot, humid environments and also governing life on board ship (Harrison, 2010; Charters, 2012).

Snelders' chapter also represents a valuable exploration in how eighteenth-century physicians reconciled old and new approaches to the body. He reveals how in this new tropical climate and under the influence of medical innovations, physicians drew on their own observations of the health problems encountered to forge new solutions to them. Yet they were still relying on the six non-naturals, which offered them both a framework and pragmatic ways of intervening to improve outcomes. As he observes, echoing other recent work on the durability of the non-natural framework, its strength lay in its flexibility, in its adaptability to new climates, to new circumstances and new illnesses (Gentilcore, 2016, pp. 27–48; Conforti, 2017; Donato, 2017).

Dissemination and reception

The study of advice on the non-naturals brings with it important questions about the intended and actual publics for this advice; the extent to which it circulated amongst different social strata and, crucially, whether there is any evidence for how it was received. Given that the essays in this volume rely on such different source materials, we see a correspondingly wide spectrum of ways through which it was disseminated, although as ever, documenting reception and practices is a far harder task.

The texts discussing the female body during the menopause, discussed by Williams, would seem to be standard medical tracts, written by physicians for physicians and we must presume that the texts were written to guide physicians attending upon menopausal women. The discussions seem quite erudite and raise the question of whether women themselves were aware of these new and quite complicated understandings of their ageing bodies and whether medical advice on managing the menopause ever circulated in more accessible forms, or was simply transmitted by word of mouth, as was often the case for childbirth (Castiglione, 2017). Recent research from late eighteenth-century Germany implies that women would not have been familiar with these subtle developments in approaches to the menopausal body, given that they had not yet relinquished a popular belief in the inherent toxicity of the menses, a notion which dated back to Antiquity (Stolberg, 2011).

At the same time, Stolberg's chapter is in some senses a testament to the extent to which at least educated lay people in the eighteenth century were aware of health advice on excretions, apparently following it assiduously: indeed, some obsessively. His diarists seem to have discussed and have monitored their bodily excretions so as to be able to intervene when necessary to

minimise the formation of dangerous blockages and corruption within. This demonstrates that one way or another, the key information on preventive health was indeed circulating to a broad public, probably through a combination of cheap vernacular regimen and oral transmission – for example, through patient–physician encounters.

Hunter's and Schmidt's chapters on sleep offer more indirect but equally valuable evidence of dissemination. Both find ideas about healthy sleep embedded in a range of literary sources, such as plays, satirical texts, diaries and accounts, whilst Schmidt also highlights the way they appear in Hogarth's graphic works. All these confirm the extent to which notions about healthy sleep had been integrated into social discourses and practices, even becoming an integral element in the construction of the virtuous gentleman and gentlewoman.

Although pro-longevity advice literature had started out by regulating the health of individuals, we have noted that over the sixteenth century, it was being written with increasingly broad readerships in mind. This volume demonstrates the extent to which eighteenth-century concerns had shifted: not necessarily away from the individual, but towards also embracing attempts to enhance the health of whole populations, or sections of it. We see here some of the multiple ways in which states sought to strengthen and increase their nations by improving their welfare and health. Environmental medicine, inspired by a Hippocratic approach, laid the blame for population decline on overcrowded cities, poor nutrition and bad air, but also to moral laxity, gluttony, laziness and other lifestyle faults (Vila, 1998).[25] Increasingly, states sought to care for the health of their populations through those environmental factors which they could control, such as through inspecting food and regulating the quality of air and water (Rosen, 1974; Donato, 2017). Complementing the increasingly strong emphasis on regulations and inspections, there was an impetus to reach out to the lower classes and educate the masses. One of the German physicians most closely associated with the concept of "medical policing" deemed that books were not read by most people, but that more popular print forms, such as almanacs (seasonal calendars), could be used to spread precepts on diet, health and the care of pregnant women, nursing mothers and infants (Rosen, 1974).[26]

The networks of physicians and natural philosophers whom we meet in several of the chapters in this volume also operated in this broader social context, whether they were gathering data so as to provide more evidence for future practice, challenging the lifestyles of the masses or circulating advice through a variety of texts. Sanislo describes how the enlightened educational reformers known as the Philanthropinists started a national conversation in Germany about the importance of ensuring the health, physical strength and hardiness of the developing male body which led to a "flood" of texts that included calendars, pamphlets and popular literature targeting lower social classes. However, given that the main targets of this campaign were the "soft, upper and educated classes," the focus was on popular medical periodicals and publications aimed at well-educated bureaucrats and administrators. Moreover, by establishing

schools where the Philanthropinists' physical programmes could be implemented, they surely hoped to attract the children of elite families by putting theory into practice. The impact of practices and their role in disseminating ideas should also not be neglected. Snelders' study shows us multiple ways in which information about health in the tropics was communicated: initially through letters and reports, then by surgeons and physicians actually involved in health care on board ships and captains who instituted their health advice. It is important to consider the impact which advice such as that by Titsingh would have had on the lives of the hundreds of men on a ship, forced to submit to the rules of health by their superiors, who then found that the overwhelming majority of them had survived rather than died on a long trip to the tropics.

Verwaal's chapter shows us that in the Netherlands, it was also intellectuals, the members of scientific academies and societies, who sought to promote and facilitate maternal breastfeeding, firstly amongst themselves through essay competitions and then to the wider educated public through the publication of winning essays. But the increase in simple "how-to" books on breastfeeding, the use of almanacs and the publication of simple vernacular poems disseminating the advice that breast milk was best for babies shows that this campaign was aimed across all of Dutch society. There were however two strands running through this literature. One was that breast milk was superior to the milk of other animals, and the other was a continuation of a long-standing theme in advice literature: that maternal breast milk was better than that of a wet nurse. Perhaps the first claim was accepted, but the second clearly was not – at least not fully amongst women of the elite. The tracts penned by two women (Bekker and Genlis) who rejected this attempt to moralise maternal feeding and the fashioning of motherhood principally as a matter of breastfeeding, reminds us that the dissemination of health advice does not necessarily equate with practice: people could and did ignore, resist and challenge health advice. So it is not just important for us to look for evidence that it was implemented, but also to look out for opposing voices and discourses. Other examples from this volume spring to mind: Schmidt describes Samuel Johnson's "utter inability" to follow regimen and the guilt which accompanied his failure to do so. Hunter's essay documents the general rejection of sleep discipline by the English elites. Guerrini notes Tryon's acknowledgement that many of his readers would find his diet of "bread, cheese, water and herbs" too challenging, hence his accommodation of their needs by including advice on raising and eating meat.

Experience, observation and sources of authority

Much recent scholarship has drawn attention to the growing importance of empirical observation as a method of enquiry into the natural world over the early modern period (Crisciani, 2005; Daston and Lunbeck, 2011; Pomata, 2011; Daston, 2011). Regimens of health were no exception to this process. By the mid-sixteenth century, although most Italian regimen continued to quote extensively from classical authors as a way of establishing their authority, they

were also interspersed with examples drawn from the author's own experience or from what appear to have been well-known contemporary observations. For example, in 1584, Pisanelli waded into the controversy over the safety of drinking iced water by citing an observation regarding the beneficial effects of cold drinking on the population of Sicily, especially Messina (De Planhol, 1995; Cavallo and Storey, 2013, pp. 222–228). He recounts how previously "great numbers" of people used to die annually from illnesses attributed to the "great heat" of the Sicilian summers, but that ever since the storage and sale of snow and ice had become a commercial venture in the late 1560s, it had been "observed" that about 1,000 fewer people died each summer from these diseases (Pisanelli, 1584, p. 160).[27] No more detail is given, but the impression is that he was citing a well-known case and observations on the matter, views which had presumably been exchanged through networks of correspondence or pamphlets.

Santorio Sanctorio's very successful *De Medicina Statica* (1737) is probably the most sophisticated example of this attempt to draw up rules of healthy living from practical observation. He experimented on over 10,000 subjects on his famous weighing chair before drawing up his conclusions about the relationships between the non-naturals and insensible transpiration, recording his results as aphorisms in chapters dedicated to each of the non-naturals (Ongaro, 2001, pp. 1–40). Far less "scientific" were those tracts and regimen which included evidential anecdotes and health observations drawn from contemporary events and personal experiences which appear to have increased the commercial appeal of regimen. For example, part of the success of Alvise Cornaro's *Treatise on a Sober Life* (1558), which is discussed in several of these chapters, can perhaps be attributed to the fact that his was the first regimen to dispense with classical authorities altogether. The short tract is a very personal account of his experience of ill-health and the lifestyle he adopted which led to his recovery, as he offers himself up as the "prime example and proof of authenticity of his claims" (Milani, 2014, p. 184). Moreover, he extends the notion of experimentation to his public, who are enjoined to try to observe the impact of different foods on their own bodies rather than accept even his proposed diet unquestioningly. Not dissimilarly, Tryon and then Cheyne also weave their personal experiences into the fabric of their health advice so as to make it more compelling. This "practice"-based approach to vernacular medicine can also be seen in the prefaces to two other extremely popular mid-sixteenth-century Italian texts by Alessio Piedmontese and Girolamo Ruscelli. These were collections of "Secrets" (recipes for making medicinal remedies and various substances used in the home) and in both volumes – which are ostensibly by different authors but now thought to have been the same man – the "authors" frame the text with lengthy accounts of how they had gained their experience and knowledge. They describe their extensive travels and how they learned about the properties of indigenous plants and how to use them from local lay people and even from women.[28]

These mid-sixteenth-century trends exemplify Pomata's suggestion that "practice" rather than academic learning was increasingly being seen as the "new source of validation" amongst provincial, heterodox physicians seeking

to promote themselves through publications (2011, p. 59). Perhaps publishers also perceived a demand for this kind of "evidential" writing coming from the broader lay readership. Certainly, it seems as if the identity fashioned for Alessio Piedmontese was an early prototype of the Dutch "adventurer-scientists" with a "freebooter spirit" described by Snelders, as they too claimed that their healthy living advice relied on knowledge derived from experience and word of mouth, and was derived from indigenous peoples or European settlers in the tropics, rather than from their medical training or academic texts.

By the eighteenth century, this evidential approach pervades the literature, accompanied by shifts in methodologies and the scale on which observations and tests could now be made. The ambitious climate reporting system set up by the Dutch *Natural and Medical Correspondence Society* as reported by Knoeff can be seen in the context of eighteenth-century Hippocratism and attempts by public officials to take a more active role in the "surveillance of community health" (Donato, 2017, p. 159). Their efforts to replace the personal observations of a few individuals with hundreds of frequent reports is a testament to the status which empirical knowledge based on observation, data collection and recording now held in the search for understanding health and its relation to one's broader environment.

As Verwaal's examination of the records of Dutch chemists shows, the advice and appeals to women to breastfeed their babies in the eighteenth century were also based on extensive experimentation into the nature and composition of milk. This enabled authors to offer compelling new explanations for the importance of breast milk for the healthy development of infants, even if there was no comparable way of proving the contention that maternal breast milk was better than that of a wet nurse.

Material culture and the non-naturals

Finally, these chapters make an important contribution to the story of the evolution of a material culture which was deployed to measure, evaluate, regulate and even minimise the impact of certain non-naturals on the body. The precedents for doing so were long-standing. Aldobrandino da Siena's thirteenth-century tract had described how pieces of linen or hemp could be saturated with cold water and hung in rooms during hot weather to moisten the air and improve its breathability (1911, p. 60).[29] Durante's *Treasury of Health* describes how one can ascertain the quality of the air and whether it is too humid by putting a dry sponge out of the window at night and seeing whether it is impregnated with moisture next morning. Moreover, if fresh bread is put out overnight and is mouldy by the morning, this indicates that the air is corrupted: but if the air is just dry or humid, the bread will retain its substance (Durante, 1586, p. 6). Regimen also referred to many objects or substances which could be deployed to intervene in air and water quality. Pomanders and incense burners for example, used in conjunction with resins and plants, offered multiple ways of "correcting" potentially harmful air. Likewise, methods of water storage, the shape of drinking vessels, the materials used in clothing, the textiles

of bed hangings, types of wall coverings and even the colours used were all implicated in the attempt to intervene in the natural world to improve health outcomes (Cavallo and Storey, 2013).

The essays in this volume show just how far health technology had developed by the eighteenth century. Schmidt subtly draws us into an awareness of the myriad mechanical and time-related metaphors which accreted around the bodily functions and attempts to regulate them, as the watches and clocks increasingly permeated early modern society. Guerrini situates her discussion of moderation amidst the glorious and irreconcilable variety of weights, measures and vessels used across Europe to quantify and control the intake of food and drink. Santorio's fantastic chair for weighing insensible perspiration is surely the most extreme development in this quest to measure diet and excretions, and his work had a huge impact on thinking about the body, although the chair itself was presumably not widely used.[30] Knoeff's chapter, on the other hand, documents the rise of a comparatively simple, small instrument – the barometer – whose diffusion through Europe seems to have been unstoppable and of huge importance for people's perception of the effects of climate on their bodies. Given the longevity of these concerns with air quality in particular, it is easy to see why an instrument as sophisticated as a barometer became so popular, particularly when such great claims were made for its predictive abilities. However, there is also a sense in which this device may have removed some of the immediacy of people's responses to their environments. For example, from the thirteenth to the late seventeenth centuries, physicians had explained how people could discern air quality using their senses, but the barometer added an interface between the individual body and the air, possibly reducing the validity of individual sense perceptions about the weather.

Verwaal's chapter not just reminds us of the "technical" and professional apparatus required for chemical analyses of milk but also reveals the extensive range of more domestic objects already in use, or developed to help with breastfeeding. It is also significant that some were made, or redesigned, or promoted as part of a more commercial side of the public "information" campaign about breastfeeding, reminding us of how closely linked health advice and the marketing of new products have always been. On the other hand, even if some objects such as the brass breast pumps were expensive, others like nipple shields and cups and breast relievers were presumably merely the latest versions of objects or materials which had long been in use by women who needed to deal with these perennial problems. As such, they surely represent the evolution of what has probably been a long-standing but hidden aspect of the material culture of health.

Conclusion

Thomas Cogan was not mistaken when he declared that "To live after the rules of phisicke is to live in health." And, for over two millennia now, the six non-naturals, whether or not they were known as such, established that

it was through managing our environment and our day-to-day behaviours that we had some hope of staying healthy. Once a comparatively neglected historical field, precisely because of its apparently "static" and unchanging nature, this volume demonstrates the extraordinary variety and mutability of ideas within preventive medicine. We see how new knowledge and explanations were repeatedly grafted onto an old structure: how concerns about individual non-naturals shifted; how changing technologies and methods of enquiry shaped health advice and practices; how advice was continually being reworked around those stubborn constants of age, gender and class. These chapters remind us of the importance of complementing medical tracts with a much wider variety of sources which can help us explore how beliefs about prevention were expounded, put into practice, received and ignored. And by bringing together studies from different national areas, they help to break down any lingering impressions we might have of a monolithic early modern European medical culture. Finally, moving as these chapters do between the concerns and agency of individuals and those of the growing eighteenth-century state, and its mediators, we are reminded that one did not preclude the other, since health advice for the masses still ultimately required engagement at an individual level.

Notes

1 Cogan, 1636, p. 2.
2 This quotation is from the title-part of the subtitle.
3 This citation is from the dedication.
4 For developments in dietary advice in regimen, see Albala (2002); Gentilcore (2016). On hot and cold drinking, see Planhol (1995, especially pp. 226–254). On lenten diets, see Gentilcore (2010); Cavallo and Storey (2013). For a discussion of plague tracts, see Cohn (2010).
5 Ken Albala asserts that "The wave of publications on diet halted dramatically in the later seventeenth century," and that "It appears that enough had been written on diet" (2002, p. 47).
6 This author is able to comment only on the situation in England, France and Italy.
7 Smith mentions many of them in her chapter on "civil cleanliness" (2007, pp. 224–263).
8 This is based on the list of "foreign" books published on diet, old age and longevity, which was drawn up by Sinclair in 1807 using libraries and lists made by other scholars. He found 1,566 "foreign" books and 312 published in Britain, whether in English or Latin.
9 This was a key notion in Hippocrates, see Nicoud (2007, pp. 3–4).
10 On the important treatise by the German physician Malachias Geiger, see Haskell (2011).
11 Shapin is however arguing that the topic *is* worth the attention of scholars despite the apparent "cultural stability and uniformity" of its advice (2003, p. 268).
12 English Protestant authors often refer to the body as the "Temple of the Holy Ghost." See, for example, Vaughan (1602, p. 62).
13 *Non é oltre a ciò da disprezzare la essercitazione della mente. […] cosi l'animo per gli studi si nutrice e acquista vigore. […] Sono gli essercitij dell'animo le speculationi e il cantare i salmi con istromenti musicali e attendere all'istorie theologiche, che queste cose dilettando all'animo, lo pascono in modo, che tutte le virtue diventino più forti […] e corroborano l'anima, e fan perfetta memoria; quindi vengono gli uomini dotti e atti al governo delle republiche.*

14 "*È sentita la crapula per cosa virtuosa, e honorevole, e la vita sobria dishonorevole, è da huomo avaro*" (Cornaro, 1630, p. 72).
15 Thomas Cogan in his 1588 *Haven of Health*, for example, criticises the lives of "Courtiers, Lords, Ladies, Gentlemen, and Gentlewomen" in his preface.
16 For the genre's early evolution, see Nicoud (2007). On regimens for different age groups, see chapter 5, and on advice about children, see Jacquart (2008).
17 This was by J. Goulin (1771). See the discussion by Gentilcore (2016, pp. 45–46).
18 Amongst Italian regimen, Fonseca devotes several pages to reproductive issues (1603, pp. 103–111); and Paschetti only discusses women in relation to exercise (1602, pp. 172–173).
19 "La femina e più freda di natura che l'homo e piu debile de complexione. Un in essa si genera di molte superfluità." This is to explain why women menstruate (Manfredi, 1532, p. 60v).
20 For passages on rest, exercise and diet, see Marinello (1574, pp. 126, 128, 200); Mercurio (1596, Bk I: Cap. XVI is a regimen for pregnant women). Mercurio (1603, pp. 343–385) has a chapter on the errors committed in the care of pregnant women and includes the correct advice (1603).
21 For example, in Razzi: *"luminoso"* and *"lucido" "mondo," "senza vapori"* are used (1587, no page numbering).
22 In Paschetti: *"grosso" "denso" "nebuloso"* and *"caliginoso"* (1602, pp. 135–136).
23 In Durante: *"grave, denso, grosso"* (1643, p. 5); in Petronio: *leggiera, rara, sottile* (1592, p. 6).
24 In earlier sources, particularly plague tracts, mention was also made of corrupt air entering enlarged pores if they were widened by hot air or exertion, but under normal circumstances, the focus was on the danger presented by air entering through the mouth and nose.
25 For example, Tissot, in his *Avis au Peuple* (1761) argued that if people stopped migrating to cities, they would be healthier and the state would be more populous.
26 This was Wolfgang Thomas Rau (cited by Rosen, 1974, p. 138).
27 "*Si è osservato, ch'ogni anno adesso ci muoiono mille personne meno di quello che faceva prima dell'uso della neve.*"
28 On the identity of Alessio Piedmontese/Girolamo Ruscelli, see Eamon (1994, pp.136, 139). On the books and their prefaces, see Eamon (2011); Biow (2015, especially pp. 117–151).
29 "Si convient en tel maison demourer … et avironee de dras de camvene et de lin moulliés en ewe froide."
30 Hollerbach observes that scholars still do not know who used it or whether it was intended for lay or medical practice (2018, p. 142).

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